Dr Harrison 8.

CONTRIBUTIONS

with the author's compliments

TO

AURAL SURGERY.

BY

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PART III.

INFLAMMATORY AFFECTIONS

OF THE

MEMBRANA TYMPANI AND MIDDLE EAR.

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PART III.(a)

NOTWITHSTANDING the remarks which we daily meet with in the periodic and "manual" literature of the day,—that the treatment of diseases of the ear is an opprobium to medicine,—the progress which this branch of medical science is making is in all probability as rapid as that of the other departments of the healing art.

Among the many causes from which this opinion has arisen, there are two which must pre-eminently attract the attention of any person conversant with the subject, or who will calmly examine into the question. The first is, that heretofore the treatment of those diseases has been committed to the hands of the most uneducated quacks and char-

(a) Part I., upon the Causes and Treatment of Otorrhœa, appeared in the former Series of this Journal, for January, 1844, vol. xxiv. p. 388. This essay has been twice translated into German,—first by Dr. Von Hasselberg, of Stralsund, in 1846, and afterwards by Dr. Schmaltz, of Dresden, during the present year. Part II., upon the early History of Aural Surgery, and the Nosological Arrangement of Diseases of the Ear, appeared in that for May, 1844, vol. xxv. p. 422.

To students and those commencing the study of aural diseases, who may be familiar with the German language, I would recommend the perusal of the work of Dr. Martell Frank, "*Practische Anleitung zur Erkenntnis und Behandlung der Ohrenkrankheiten*," &c. &c., Erlangen, 1845.

latans, male and female,—persons totally unacquainted with the first rudiments of medical knowledge; the second, that medical men themselves,—most astute and practical physicians and surgeons in all other respects,—treat diseases of the ear certainly in a manner that savours of empiricism, by prescribing nostrums, of both a local and general character, which we know they would never think of using in similar forms of disease in other organs of the body. This latter cause evidently results from want of proper attention to the subject in our schools, and from the practice of prescribing at random for diseases, the diagnosis and pathology of which are unknown to practitioners themselves. To these causes may be added others that, to a certain degree, serve to bias the public mind against the treatment of aural diseases. In many cases, there is either an unconsciousness of the insidious approaches of deafness, or an unwillingness to admit even the possibility of such an occurrence; or, again, there is an apathy and indifference, to a greater or less degree, on the part of those affected with deafness, to seek advice, which is scarcely credible. Persons who, if they suffer the least inconvenience in any of their functions, or the slightest disturbance of the due exercise or healthy condition of any of the other organs of sense, would immediately apply for medical relief, and submit to any, even the most severe form of treatment, will patiently permit the sense of hearing to be greatly impaired, nay, even lost on one side, without making any effort for its restoration. When the lapse of months, and even years, have contributed to confirm and render incurable such persons, they generally respond to inquiries with regard to previous treatment,—that they did not like to be "tampering" with their ears, or, that they were told nothing could be done for them. It would in no wise conduce to the practical effect to which I hope this paper may tend, to inquire into the causes of these results; I may, however, mention, that medical men themselves have in part conduced to produce this want of faith on the part of the

patient, either by direct opinion as to the incurable nature of the disease or diseases known by the symptom of deafness, or by such futile treatment as broke down the confidence of the patient in any form of treatment for diseases of the organs of hearing. It is true that cases of what are termed "nervous deafness," that is, of defect of the hearing function of the acoustic nerve in any part of the internal ear, from paralysis or other causes,—or of those portions of the brain which preside over the functions of hearing, or give origin to, or are connected with the portio mollis of the seventh pair of nerves,—in fact, such cases as are analogous to amaurosis,—are as intractable as that disease of the eye;—yet I fear not to reiterate the assertion which I made upon a former occasion, that if the diseases of the ear were as well studied or understood by the generality of practitioners, and as early treated, as the diseases of the eye, it would be found that they were just as much within the pale of scientific treatment.

Notwithstanding that we have now several special works upon aural surgery, as well as some valuable monographs in the cyclopedias and periodicals, it is to be regretted that the modern Systems of Surgery contain but scanty information upon the subject of diseases of the ear.

The following passage from M. Druitt's well-arranged work (which is an exception to the class), is so apposite to the foregoing observations, that I insert it: "Deafness is so common and so distressing an infirmity, and when of long standing, is so incurable, that we cannot too strongly urge all medical practitioners to make themselves familiar with the treatment of diseases of the ear. They should also encourage their patients to apply to them for the relief of *slight* and *incipient* ailments in this organ, instead of allowing them to go on till they become permanently deaf, and then letting them fruitlessly seek relief from ignorant and mercenary quacks."(*a*)

(*a*) Druitt's Surgeons' Vade Mecum, p. 382.

With these preliminary remarks I beg leave to lay before my readers some observations upon the inflammatory affections of the external membrane of the tympanum. Before, however, I enter upon the description of these diseases I feel it incumbent upon me again to offer a few observations with respect to the best method of conducting an aural examination, the only true mode of arriving at an accurate diagnosis; and I shall confine my observations as much as possible to those means which are especially requisite in the diseases about to be considered. I suppose the practitioner perfectly familiar with the normal and healthy condition and appearance of the parts, particularly the membrana tympani.

METHOD OF EXAMINATION.

Passing for the present the subjective symptoms, which will best appear in the words of the patient, in the course of this paper, let us inquire into the best method of forming a diagnosis from the physical signs which are present. The patient being placed opposite to a strong, direct sun-light, with the head inclined at such an angle that the sun's rays may fall directly through a tubular speculum upon the membrana tympani, we first carefully observe the condition of the concha, external meatus, mastoid process, infrazygomatic region, and that situated immediately below the lobe of the ear; *the auricle*, its various folds, its colour, its temperature in particular, its thickness as learned by grasping its hem or helix between the fingers, and the angle which it forms posteriorly with the cranium(*a*); then

(*a*) Acquired as well as congenital malformations of this portion of the auditory apparatus are not uncommon. Among the various methods adopted to distort this beautiful acoustic instrument, so admirably formed and adapted for collecting and transmitting sound, may be enumerated the pains effectually taken by old ladies to obliterate all the folds of the external cartilage, by tying it close to the head with a tight band, and continuing this distorting process without intermission for years together.

the position, size, shape, and colour of the *external meatus*, as seen without altering the relation of the parts(*a*). The upper rim of the helix should then be grasped between the finger and thumb of one hand, and drawn upwards, backwards, and outwards, while the thumb of the other hand placed in front of the tragus, by drawing it and the integuments forward upon the zygoma, exposes the outer third or more of the auditory canal to view. The finger should then be pressed deeply and firmly upon the moveable root of the *tragus*, and backwards into the depression between it and the articulating surface of the jaw. While the finger is retained in this position the patient should be desired to open and shut the mouth, and the amount of pain or inconvenience experienced by the pressure in those two different positions of the jaw accurately noted. The middle and fore-fingers should likewise be inserted deeply behind the ramus of the jaw towards the styloid process, and notice taken of the sensations there experienced.

The *mastoid process* in an especial manner claims our attention, where we have reason to believe inflammatory action exists. Its colour, size, shape, temperature, may be learned by even a cursory examination; but, besides this, it should be most carefully pressed upon with a couple of fingers, with a much greater degree of force and firmness than is usual in making examinations of the like nature elsewhere; and not only should this examination be applied to the mastoid region, but to the whole posterior and lateral portion of the head, if we have reason to suspect any inflammation, or its effects. The insertion of the sterno-mastoid(*b*), as well as the upper

(*a*) Without any recent or manifest disease the external meatus may, instead of presenting an irregular ellipsoid, be converted into a mere slit by the pressure of the tragus backwards, or it may be preternaturally dilated, or we may find it affected by stricture.

(*b*) There is a small gland, in shape and size like a horse bean, situated immediately behind the auricle, over the middle of the mastoid process, which

third of that muscle, should also be carefully examined in the same way. If the integuments and soft parts are swollen or œdematous, as is frequently the case in certain inflammatory affections of the ear, as also where they have become thickened from long-continued disease, it will require a considerable degree of force to make a perfectly satisfactory examination. The amount of pitting made by the finger during this examination, and its degree of permanency, are also circumstances of value in the formation of a diagnosis. Percussion of the mastoid process, immediately behind the attachment of the auricle, occasionally affords some information, as will be shewn in some of the cases hereafter to be detailed.

We next proceed to inquire into the condition of the *auditory canal*, and external surface of the membrana tympani. To effect this, and to explore every portion of the surface of these parts, it is necessary to resort to the mechanical assistance of the speculum(*a*), first taking care to remove any im-

frequently becomes enlarged during the progress of aural inflammations. It is also the seat of violent neuralgic pain in some instances.

(*a*) From a long and most extensive use of the tubular speculum, which I was the first to introduce into this country (see Essay upon Otorrhœa), I am convinced that it is not only the simplest, but also the most effectual instrument for examining the condition of the membrane of the tympanum and the external auditory canal. Various instruments constructed with divarieating arms, tubes with prisms, and divers lamps, have been recently invented, and their virtues set forth in graphic terms by their inventors and supporters, but they are all comparative failures, and for the following reasons: divarieating instruments cannot enlarge the osseo-cartilaginous portion of the canal near the tympanum; the prisms are totally unnecessary, and even disadvantageous where direct light can be procured. The various lamps possess these two radical defects: the light which they transmit throws a peculiar lurid glare upon the entire of the parts which they illuminate; and although an irregularity of surface, a polypus, an aperture in the membrana tympani, or the like, may indeed be detected, yet shades of colour, vascularity produced by inflammation or congestion, slight opacities, minute points of morbid deposit, and slight ulcerated abrasions, want of polish, and loss of transparency, &c., cannot be detected by their means. Again, although we

paction of wax, accumulated discharge, or other mechanical impediment which may exist and obstruct our vision. If this obstruction is complete, and that we have reason to suppose that it is the chief cause of deafness, the employment of a syringe and some plain warm water is the best mode of removing it; but if the obstruction merely co-exists with other, and particularly some of the inflammatory affections of the meatus or tympanal membrane, or if it be only partial, and consists of

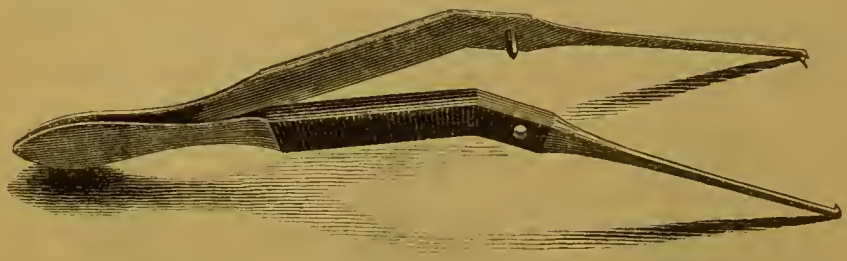
were able to detect an ulcer, a granulation, or a perforation, we are not able, while the eye is fixed upon the spot, to apply any direct remedy to the parts affected,—to pass down a porte-caustic, a forceps, a snare, or a camel-hair brush, &c., through this lamp. How, for instance, could a hair, no uncommon cause of annoyance, be removed off the surface of the drum but through one of these tubes? No obstetric practitioner thinks of examining the os uteri or the surface of the vagina with a lamp, so long as the sun's rays can be directed through a tubular speculum to the parts affected. The accompanying illustration exhibits the forms of specula which I still find to answer every useful purpose.

It is unnecessary to blacken the interior of the speculum, and the shorter it is made the more easy will it be found to employ instruments upon the membrane of the tympanum, or the lower portion of the passage, through it. By means of these tubes, employed, as I have directed in my former essay, with bright direct sun-light, every portion of the meatus and the membrane of the drum may be as clearly and accurately investigated as the surface of the eye. There are cases, however, in which a lamp may be employed: they are those in which it is imperatively necessary to examine the ear on a very dark day or at night. It is of great consequence that, in

portions of detached cuticle, hairs, or scales of hardened, inspissated cerumen, it is better to remove these gently with a pair of fine forceps(*a*), because the very act of syringing, even with warm water, causes in a healthy ear an increased vascularity, which will in a diseased ear mask the actual amount of disease present. The same observation applies also with respect to slight otorrhœa, but if there be much discharge present we must have recourse to the syringe. The form, curvature, colour,

making these examinations, the shadow of the operator's head should not fall within the sphere of the speculum. It should be a little above or a little below it, according to the sun's elevation at the moment.

(*a*) Having found that the handles of the instruments introduced through the tubular speculum and the fingers of the operator interfere to a certain degree with the direct sun rays, I have latterly had instruments constructed with an angle in the shaft, as shewn in the accompanying view of a pair of ear forceps,



the utility of which is at once manifest. In the same way I have improved upon the snare for removing polypi, as shewn in the accompanying cut. In making this instrument, the loops at the side and the holes at the top should be made very smooth and their edges bevilled off, so that the wire will not scrape or cut in running through them.

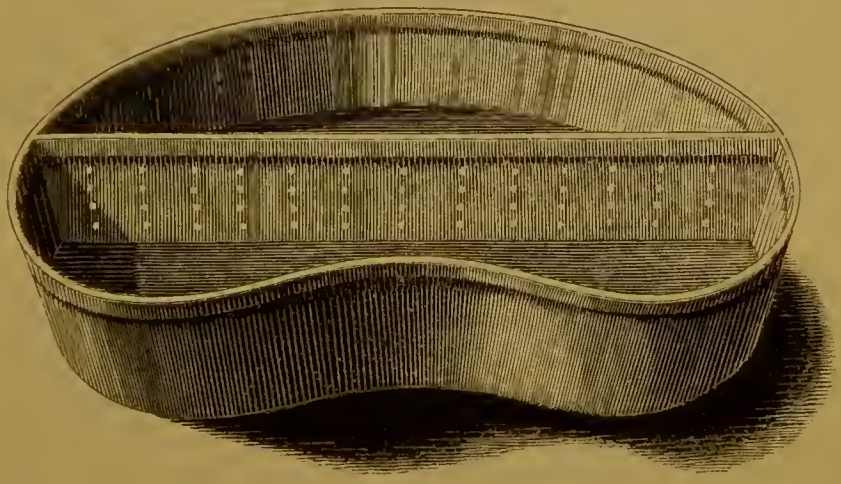
All ear instruments should be constructed upon a like principle.

For syringing the ear I have found the form of vessels represented on the other side very useful: it is six inches long, four broad, and two deep; its

polish, vascularity, and the secretion of the entire auditory canal, should be accurately observed.

Having brought the whole of the auditory canal and the entire of the *membrana tympani* under our view, we must take accurate note of their colour and relative positions. The tympanal membrane, in an especial manner, claims our attention; not only its *superficial colour*, but its degree of *transparency* or *opacity*, its *tenuity* and *thickening*, its *vascularity*, and the *arrangement and position of its vessels* in every part,—its *tension*, *flexibility*, *polish*, *curvature*, and the position both to the interior of the cavity of which it forms the outward boundary, and also to the handle of the malleus, both above and below the attachment of this bone, should be carefully observed(*a*). While the membrane is thus within the field of the speculum, the patient

concave part fits accurately the curve beneath the lobe of the ear; and the perforated septum strains the clean water from the dirty.



Simple as the operation of syringing appears, it requires some caution and dexterity in its performance.—While the patient holds up the pan, the helix of the auricle should be grasped with the left hand, so as to straighten the auditory canal, and then a proper brass syringe, with a pair of large loops attached to its upper extremity, through which the fore and middle fingers of the right hand are passed, injects a steady stream of water, by the thumb working the piston. In some persons the act of syringing, and in others the mere introduction of a speculum, induces violent paroxysms of coughing.

(*a*) The membrane of the tympanum is, as I have already stated, not

should be desired to try and press air into the drum by holding the nose, shutting the mouth, and making a forced expiration(*a*). This manœuvre should be resorted to several times, if the first be ineffectual, as some degree of tact on the part of the patient is necessary to test the experiment. While the air is thus pressed into the drum we should note accurately whether the membrane vibrates, or its tensity is altered, and if so, whether it regains its original position suddenly or gradually. The patient's own sensations should likewise be taken into account in this matter. It is also especially necessary carefully to observe the degree of vascularity produced by this inflation, as well as the course and position of the vessels which cause such vascularity(*b*), and if a small aperture exist in the membrane which may have escaped the eye, we may then readily detect it both by sight and hearing. By this means we often detect a small perforation in the membrane, which, from its minuteness, or owing to the part being thickened or coated with discharge, had previously escaped our first mere ocular inspection. If such exist, we shall then see its open everted lips sometimes pressing out mucous discharge, and also hear a peculiar whistling sound, which the air makes in passing through this narrow

what it is described in anatomical works, concave on its outer aspect, but presents in the normal condition a number of curves, the most prominent, however, of which is that presented by its inferior and anterior portion, below the attachment of the malleus, which is a *decided prominent convexity*, as may be seen, not by inspection of the dead subject or an anatomical preparation, but by examining the parts in a living, healthy ear. Any deviation from this condition is the result of disease, and attended with more or less impairment of hearing, as the alteration in the curves of the media of the eye are attended with certain peculiarities of sight, as I have already explained in my second contribution to aural surgery, p. 431. See also the Dublin Dissector, fifth edition, p. 673. The normal colour and consistence of this membranous septum is very like that of fine gold-beaters' skin.

(*a*) The sound thus produced very much resembles that of a dried bladder suddenly inflated into air.

(*b*) In several healthy ears, if this experiment is made two or three times, we seldom fail to recognise one or two vessels becoming filled with red blood along the course of the malleus.

aperture. There are some cases of perforate membrana tympani, where, from obstruction in the upper part of the Eustachian tube, or granulations in the middle ear, this cannot be effected. If the patient be able to inflate the tympanum by this method, we may then remove the speculum, and, applying our own ear, either directly or through the intervention of a stethoscope, over the external auditory passage, the same method of inflation should be again had recourse to, and the peculiarity of sound which is thus produced in the middle ear, whether the ordinary normal rush of the air into the tympanum, or a prolonged squeeling or gurgling sound, such as might be produced by any contraction in or thickening of the walls of the Eustachian tube, or by dryness, or by accumulation of mucus in it or in the cavity of the tympanum, is heard. The stethoscope should also be applied over the mastoid process, and the same series of observations made upon the sounds, if any, produced there.

If the patient be unable to inflate the tympanum, and that we have reason to suspect some obstruction of the *Eustachian tube*, or an accumulation of mucus, blood, pus, or other matter, in the tympanum, we may then, should the case require it, proceed to inject air, by the mechanical means of a catheter and pump, through the Eustachian tube(*a*) into the cavity of the tympanum, while we carefully note the result by means of a stethoscope, or the ear applied externally. It must, however, be particularly borne in mind, that if the patient is labouring at the time under acute inflammation of the drum or its membranes, or the lining of the Eustachian tube, the catheter is not only inapplicable, but highly injurious. The effort of coughing, sneezing, blowing the nose, and deglutition, in causing or increasing pain, is also to be particularly attended to.

There are two methods of examining the ear, on which, from their frequency in this country, I am induced to make

(*a*) I have latterly found it very seldom necessary to resort to this operation, as the cases in which it is applicable are of much greater rarity than is usually supposed, or as the works of aurists would lead us to believe.

some remarks, in the hope of putting a stop to practices not only useless, but in some cases highly injurious. I allude to the common resort of syringing, and also of probing the ears indiscriminately, and without proper inspection of the parts. The former is of daily occurrence. A patient labouring under deafness, or, what perhaps is worse, violent pain in the ear, is examined either with the unassisted eye, or by means of some of the old divaricating specula, most probably in a badly-lighted apartment,—at all events, without the membrana tympani being brought into view, a dark cavity being all that the explorer has been able to perceive,—it is deemed advisable to try what might come out by squirting hot water into this dark passage for the ensuing quarter of an hour; but, nothing satisfactory following this operation, the diagnosis that there is no wax in the ear is accordingly made. Now, there may be a collection of cerumen, which may not be got rid of by this operation; while, if the cause of the pain or deafness is owing to an inflammatory condition of the auditory canal and its membranous extremity, a decided increase of the symptoms is produced by this unnecessary and cruel proceeding. Again, I have frequently seen inflammation produced by unnecessarily syringing an ear where no wax was present.

The practice of exploring an ear by means of a probe I cannot too strongly condemn, and yet that it is frequently resorted to surgeons are well aware. To introduce a probe down to the membrana tympani, without having that membrane fairly within view, and without a speculum being passed down to it, but merely for the purpose of satisfying the examiner as to whether the membrane is perforate or not, is, I think, a most unjustifiable proceeding.

The degree of *deafness* may be measured by holding an ordinary watch near the external meatus, and the distance at which the tickings can be accurately counted, and at which the patient is conscious of an interval between these sounds should be recorded. To effect this properly the watch should be approached gradually to the ear till it gets within the hearing

distance, and again applied directly to the auricle, and gradually removed to some distance. It is absolutely necessary, if we wish to watch the progress of a case, not only to make these observations with great care, but also to make a written note of the *hearing distance* the first and each subsequent time we see the patient(*a*). By this means we have the most satisfactory report of the progress of the case, both to ourselves and the patient. We should also test the hearing with the mouth open as well as shut. This test of the hearing distance should be tried both before and after the inflation of the tympanum, as in many cases that act will produce a very material difference in the amount of hearing. The watch should next be applied both behind and in front of the auricle, and to the forehead, and also placed gently between the teeth of the patient, and the amount of hearing thus obtained likewise noted.

The state of the *throat*, the arches of the palate, uvula, tonsils, and back of the pharynx, should next be inquired into, particularly as regards the state of the mucous membrane, its colour and degree of relaxation. So also with that of the nose. The fore-finger should then be introduced far into the mouth, and its point made to press firmly upwards and outwards against the arch of the palate, opposite the mouth of the Eustachian tube, and notice taken of the degree of pain or inconvenience it produces in the middle ear.

I have thus described the routine of examination that will be found most practically useful. Having proceeded thus far we may inquire into the history of the case, its duration, pro-

(*a*) Various instruments, producing a ticking sound by means of clockwork, have been invented, by Schmalz and others, for this purpose, but the watch is quite sufficient. It must be remembered that there is almost as great a difference in the normal hearing distance as there is in the seeing distance, even among persons who have never laboured under any disease of the ear, and who are not at all conscious of any defect of hearing.

The degree of hearing with a watch is sometimes deceptive; some patients who cannot hear a watch or even a clock, will hear the voice, even in a low tone; but these are the exceptions to the rule.

bable cause, and subjective symptoms, the pain, noise, &c., in the usual manner in which we would proceed to examine any other medical or surgical case. There are, however, two inquiries which should be particularly made: first, as to the probable hereditary nature of the complaint; and, secondly, as to the existence of *tinnitus aurium;* and, if such be present, what are the peculiar characters of it; how many kinds of noises are experienced; whether they are permanent or intermitting; under what circumstances they are decreased or diminished; and, above all, whether the patient refers them to the ears or the interior of the head; and whether one or both ears are equally affected by them.

While inquiring into the amount of deafness, and the circumstances under which the hearing is increased or diminished, we should learn whether it be improved or not when the patient is exposed to loud noises, as when standing in a mill, walking through a crowded street, or travelling in a carriage, &c. The general health of the patient, the performance of all his functions, and the endeavour to ascertain how much of the disease is purely local, or dependent upon some constitutional affection, will, no doubt, occupy the attention of an educated physician or surgeon, so that it is unnecessary here to call special attention to these circumstances.

In the foregoing remarks, which are chiefly intended as a guide to those who may be inclined to study aural diseases, I have confined them as much as possible to such as were applicable to the formation of a diagnosis in the inflammatory diseases of the ear or their results.

AUTHORITIES.

To review all the opinions of authors in a communication intended solely for practical purposes, and for the readers of a periodical, would savour more of the System or the Cyclopedia than the occasion demands, or our space permits. Let the following references, therefore, suffice.

Myringitis, or inflammation of the membrana tympani, has not been recognised or described by authors until within the last few years: and its varieties, with their peculiar symptoms, are by no means accurately understood. Itard, one of the earliest and most esteemed writers upon aural surgery, has not mentioned it, though the symptoms of at least one form of the disease are enumerated by him under the head of internal otitis(*a*). The old divisions of inflammation of the ear into otitis externa and interna do not in any way assist either our diagnosis or improve our treatment of these diseases. The same may be said of the divisions into acute and chronic. The otorrhœa, which follows in such cases, and which formed, with many writers, grounds for nosological arrangement, being but a symptom, like leucorrhœa in the female, is an insufficient ground of diagnosis.

Lincke, whose work is well worthy of being translated into English, classes the aural inflammations according to their causes, as the erysipelatous, scrofulous, syphilitic, rheumatic, catarrhal, morbillose, variolous, scarlatinous, &c., &c.; but the exact locality or seat of the original inflammation, or the peculiarity of the appearance of such, is not specified. These are merely enumerations of diseased actions, generally characterized by mucо-purulent discharge, attendant on, or following these different affections. The Leipzig physician, however, was one of the first accurate describers of the "*Entzündung des Trommelfells*," the true Myringitis(*b*).

Kramer devotes a chapter to the consideration of acute inflammation of the membrana tympani, but upon a careful perusal of it we find about three pages devoted to the description of that disease, while the remainder is occupied with the consideration of polypus, and a detail of the various methods recommended for performing perforation(*c*).

(*a*) *Traité des Maladiés de l'Oreille et de l'Audition.* Deuxieme edition. Paris, 1842.

(*b*) *Handbuch der theoretischen und praktischen Ohrenheilkunde.* Leipzig, 1837.

(*c*) The Nature and Treatment of Diseases of the Ear, translated by

Mr. Pilcher disposes of the inflammation of the membrana tympani in a few pages, but enumerates most of the symptoms of the affection (except the minute appearances of the membrane), under the head of otitis interna(*a*).

Mr. J. W. Jones, in the article "Ear and Hearing, Diseases of," in the Cyclopedia of Practical Surgery, has given a short description of one form of the disease. I cannot, however, agree with him, that in "otitis interna morbid changes occur in the membrana tympani only when it is threatened with bursting by the matter accumulated in the cavity of the tympanum, and has also become involved in the inflammatory action." On the contrary, my experience leads me to believe that inflammation of the middle ear always, and at the very commencement, is shewn by the appearance of the membrana tympani; and this observation must remain undisputed until a sufficient number of accurate examinations shall have been made, in the commencement of cases of otitis interna, to negative it. I may affirm the same of ear-ache, otalgia, neuralgia of the ear, &c.; but of this hereafter.

It is quite plain from Dr. Williams's account of the "inflammation and ulceration of this membrane," that he never *examined* the membrane in this condition. Indeed, I doubt if he ever *saw* the disease under consideration(*b*).

Dr. Copland, in his compilation of aural affections, has quoted the best authors on this subject, and may be consulted with benefit(*c*).

Dr. Martell Frank has lately given a concise but faithful description of both the acute and chronic form of the disease(*d*).

Dr. J. R. Bennett. London, 1837. See also his recent work, *Beitrage zur Ohrenheikunde*. Berlin, 1847. I shall refer to this latter farther on.

(*a*) A Treatise on the Structure, Economy, and Diseases of the Ear. London, 1838.

(*b*) Treatise on the Ear, including its Anatomy, Physiology, and Pathology. London, 1840.

(*c*) Dictionary of Practical Medicine, &c.—Articles, Ear and Hearing. Parts III. and IV.

(*d*) Already quoted at note, p. 382.

M. Hubert-Valleroux does not even enumerate the inflammation of the membrana tympani in his catalogue of aural diseases(*a*).

Schmalz has done little more than glance at the disease. He has evidently mixed up the description of its symptoms with those of other inflammatory affections of the ear(*b*).

I have connected, in the heading of this communication, the inflammations of the membrane of the tympanum with those of the middle ear, because I do not believe it possible for one to exist independent of the other for any length of time, no more than an ophthalmia can be circumscribed: or than we can by the term iritis define simple uncomplicated inflammation of the membraneous diaphragm of the ocular chamber.

When I first commenced the study of aural diseases, I believed that the deafness and tinnitus, in most cases where I had no positive evidence of disease in the meatus or membrana tympani, was caused by some defect in the nerve of hearing, or what is termed "nervous deafness." As, however, my field of observation extended, and as my knowledge of the healthy appearance of the membrane improved, I gradually began to find that the instances of deafness with *perfectly healthy* tympanal membranes which fell under my observation were comparatively few, while I became daily familiarized with a variety of pathological appearances in these structures, which I am now fully convinced are the result of different forms of inflammation of an acute or chronic nature, arising from some idiopathic or specific cause. These appearances have naturally led me to pay particular attention to those diseases in their early stages, the only period in which, in most of them, art can be of any avail(*c*). These appearances I shall endeavour to describe in the following essay.

(*a*) *Essai Theorique et Pratique sur les Maladies de l'Orielle.* Paris, 1846.

(*b*) *Erfahrungen über die Krankheiten des Gehöres und ihre Heilung.* Leipzig, 846.

(*c*) If we examine the inmates of a blind asylum we are at once struck

Mr. Toynbee, in his very valuable contributions to the morbid anatomy of the ear, published in the Medico-Chirurgical Transactions, has shewn the frequency of lesions of the middle ear, the result, no doubt, of inflammatory action; it is, however, to be regretted that the symptoms exhibited during life by the persons from whom his preparations were taken have not been recorded(*a*).

Dr. Kramer, in his late work, *Beitrage zur Ohrenheilkunde*, has given an extensive statistical table of diseases of the ear. The number of cases which he has recorded amounts to 2000, but of this number it must be remembered that 208, or one-seventh of the whole, were diseases of the auricle and external auditory passage. He includes all the diseases of the tympanal membrane with those of the external ear, whereas in my opinion they belong equally, if not more so, to those of the middle ear; indeed I believe that the chronic as well as the acute inflammation of the membrane is accompanied by disease in the middle ear more frequently than disease in the auditory passage. Of the 2000 cases observed, the inflammations of the tympanal membrane amounted to 442, or something less than one-fourth of the whole. Of these cases 45 were acute, and 397 chronic inflammations. About one-twelfth of the whole, or 164 were inflammations of the middle ear, but which he does not tell us were originally connected with, or subsequently produced changes in, the tympanal membrane. If in these 164 cases the inflammation of the mucous membrane of the middle ear was confined to that lining the bony parietes of this cavity: not extending over the extensive surface stretched over the back of the membrana tympani, not propagating inflammatory action there,

with the fact that nine-tenths of the cases of loss of vision there presented are the result of inflammatory action; the cases of pure unmixed amaurosis are comparatively rare, either on account of their actual scarcity, or because the patients so affected have already been carried off by the cerebral disease which was the original cause of their blindness.

(*a*) Med. Chir. Trans., vols. vi. and viii., second series.

and producing the effects of inflammation upon transparent or diaphanous membranes, as we see it does upon the aqueous membrane lining the back of the cornea, then have we no analogy for such a state of things in any of the other departments of pathology? To these 164 cases of inflammation of the lining of the tympanum, he has added thirty of alterations in the Eustachian tube, and four of inflammation of the periosteum; in all, 198, or one-tenth of the whole. Among the diseases of the ear he has included 46 instances of deaf-dumbness. With most of these statistics we find no fault; and to the various tables exhibiting the causes, ages, sexes, &c., we must, in common with all who will examine them, award to the zeal and industry of their author the amount of credit which they deserve.

When, however, we come to examine into the chief cause of deafness enumerated by the Berlin aurist, we at once perceive that his favourite theory of "nervous deafness" has been pressed into the service, and this item made to exhibit a magnitude which we have strong hopes of seeing Dr. Kramer himself one day criticise with more severity than we are now willing to do for him. Of the entire number of cases recorded, 1028, or somewhat more than one-half of the whole, are set down as "*Nervöse Taubheit.*" It would occupy more space than we are able to devote to this portion of the subject, to enter at any length into a discussion calculated to shew the fallacy of the reasoning adduced by the author to satisfy his readers that these were absolute cases of nervous deafness. The most that can be said of these 1028 cases, many of which must, we doubt not, have been caused by affections of the auditory nerve, is, that in these the parts capable of inspection exhibited no symptoms of disease. In which case, he says, "the use of the ear-catheter is the only means, either by blowing through it, or by injecting compressed air from the air-press, or by the introduction of a catgut string, or a small whalebone, or ivory probe, to learn the condition of the Eustachian tube and the cavity of the tympanum, and thereby, in the cases in question, to judge of the

condition of the auditory nerve,"—p. 26. But even this hazardous mode of making an examination,—by introducing a foreign substance into the cavity of the tympanum!—is at best but a negative proof. By it the condition of the ossicula, the membranes of the fenestra ovalis and the foramen rotundum, the fine mucous membrane, with its nerves, lining the tympanic cavity, the state of the labyrinth and the internal ear, or the brain, *cannot be investigated*(*a*). Is there any other organ of sense in which the affection of the nerve bears the same proportion to all the other diseases of the part as this?—would any table of the affections of the eye be acknowledged as authentic, in which more than one-half of the diseases of that organ were ascribed to amaurosis, or amaurosis not consequent upon some inflammatory condition?

The accompanying table of 708 cases of aural disease, registered at St. Mark's Hospital during the last three years, although, no doubt, liable to the defects under which the investigation of these diseases still labour, gives, without going too minutely into the subject, a tolerably good idea of the proportion of the inflammatory to the other diseases of the ear, most common among the lower orders of Dublin.

The details of this table are to be found in the annual reports of the institution. During the year 1834-35, I was not as intimately acquainted with the pathological appearances of in-

(*a*) I have heard of cases in which the middle ear has been said to be explored by such mechanical means, even in this country, and I have been shewn steel sounds manufactured for the purpose. Such instruments are, however, with the exception of the tearing and inflammation which they may cause in the nasal extremity of the Eustachian tube, perfectly harmless, for they could not by any possibility, even in the dead subject, be passed through the upper end of the Eustachian tube. The only instrument I ever venture to pass into the drum is a fine ivory bougie, rendered flexible by having its earthy material extracted by means of an acid. In employing this instrument, a large-sized catheter should first be passed into the bell-mouth of the Eustachian tube, and the bougie, with about half an inch of its extremity previously softened by immersion in warm water, should then be introduced through the catheter and passed up with great gentleness and caution through the Eustachian tube into the middle ear.

flammatory action as I am at present. In the tables published for that year, the cases set down to nervous deafness amounted to thirty-two out of 184; but from the subsequent tables, and more careful examinations, I am inclined to think that the number of cases registered under this head for that period were exaggerated.

Diseases.	Ages and Sexes.										
	Under 5		6 to 15		16 to 30		31 and up.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Gen. Tot.
Otitis, ...	3	1	9	3	8	6	9	8	29	18	47
Acute Myringitis, . .	..	2	4	5	10	9	4	5	18	21	39
Chronic Myringitis, .	..	1	8	6	15	15	20	17	43	39	82
Abscess in Mem. Ty.,	..	..	1	..	..	..	1	..	2	..	2
Granular Mem. Ty., .	..	..	..	..	1	1	2	1	3	2	5
Collapse of do., . . .	..	..	1	1	1	1	1	5	3	7	10
Otorrhœa, ...	13	8	39	38	31	37	10	9	93	92	185
Do. with Polypus, .	..	..	7	5	6	3	2	1	15	9	24
Do. with Perforation,	..	..	1	..	1	1	..	1	2	2	4
Nervous Deafness, .	..	1	9	4	11	14	34	21	54	40	94
Tinnitus Aurium, . .	..	..	..	..	1	7	2	4	3	11	14
Otalgia, ...	..	..	..	..	1	1	1	1	2	2	4
Hæmorrhage from Ear	..	..	..	..	1	..	..	..	1	..	1
Deafness from Cerumen, ...	1	2	8	8	14	12	73	43	96	65	161
Chron. Infl. of Exter. Meatus, ...	..	..	2	1	4	3	..	3	6	7	13
Contraction and Ulceration of do. . . .	..	..	1	..	..	..	..	..	1	..	1
Eczema of Auricle and Meatus, ...	3	1	2	1	1	2	..	5	6	9	15
Congenital Malformation, ...	..	..	..	..	1	..	..	..	1	..	1
Deafness from Disease of Throat, ...	..	..	2	1	..	1	1	1	3	3	6
	20	16	94	73	107	113	160	125	381	327	708

The foregoing Table does not include all the diseases enumerated in my nosology, but for the purposes intended too minute a division would be disadvantageous. From this Table the proportion of cases of nervous deafness to those the result of inflammatory action are but 1 in 5, to speak in round numbers.

I have become acquainted with the following forms of inflammation of the membrana tympani:—

I. Acute inflammation of the membrana tympani, accompanied by inflammation of the cavity of the tympanum; frequently of a rheumatic character.

II. Subacute inflammation, unaccompanied by pain.

III. Chronic inflammation, with or without inflammation of the tympanum.

IV. Strumous inflammation.

V. Syphilitic inflammation.

VI. Febrile subacute inflammation, accompanying the exanthemata and other fevers; generally producing otorrhœa (already described in Part I.)

I. ACUTE MYRINGITIS.—HISTORY AND SYMPTOMS.

In *acute inflammation* of the membrana tympani, the vascularity is generally seated in the true, fibrous membrane of that structure, and is usually the result of cold, and often attributed to rheumatic diathesis: sudden exposure to a low temperature, blasts of harsh cold wind, diving in the sea, foreign bodies, and irritating substances introduced into the external ear, &c. The auditory canal, and sometimes even the auricle, is engaged; and although we are not able to observe the precise pathological condition of the cavity of the middle ear, or its investing membrane, there can be little doubt but these parts, sooner or later, participate in the general inflammatory action. As, however, we denominate that form of internal ophthalmia which chiefly or primarily attacks the iris, an iritis, although in the severer forms of that affection, several if not all, the other textures of the eye eventually become engaged, so in inflammations of the membrana tympani, to which the term myringitis is applicable, we must expect that sooner or later the adjoining structures,—the mucous membrane lining the tympanum, with its numerous nerves, the nerves themselves which cross this cavity, the mastoid cells, the investitures of the Eustachian tube, the membrane of the fenestra ovalis and fenestra cochleæ, the muscles, ligaments, and other connexions of the ossicula,

the labyrinth, the internal ear, and the auditory nerve itself,—must sooner or later participate in the unhealthy action going forward; and must, either directly by the inflammatory lesion, or its subsequent effects, serve to impair hearing, and cause organic changes in this delicate organ. But in addition to the changes analogous to those which occur in ophthalmic inflammations, we have here, from the peculiar anatomical structure of the ear, superadded an extension of disease to parts which not only destroy the sense of hearing but prove dangerous to life, as when the periosteum, the bone, and even the membranes of the brain, or the encephalon itself, become engaged. The dermal structure of the membrana tympani also partakes of the abnormal action, and, together with that of the auditory canal, pours out a muco-purulent secretion, or even pus itself,—is occasionally raised into vesicles, becomes the seat of pustules, ulcerates, throws out granulations, and becomes thickened, &c., during the progress of this disease. The true fibrous membrane passes through all the pathological changes to which such structures are liable from inflammatory action or its results; and although the precise anatomical condition of the two may not be analogous, yet the diseases of the cornea and of the membrana tympani bear a remarkable analogy, particularly in the subsequent appearances of vascularity, thickening, opacity, morbid deposits, &c., which they present, together with adhesions by bands of membrane to the parts within the chambers, to which they form the external boundaries;—while inflammation of the lining of the meatus auditorius, the auricle itself, and the periosteum of the cranium adjoining, particularly over the mastoid process, is a very formidable and by no means uncommon symptom.

The following are generally the order of symptoms. A seizure of sudden and intense *pain* in the ear itself, generally, first appearing at night, and attended with nocturnal exacerbations during the progress of the disease. This pain is of a most excruciating kind, producing at times delirium, and

is usually likened to that of a sharp instrument penetrating through the ear to the brain: this pain, especially when the cavity of the tympanum is injured, is increased by coughing, sneezing, chewing, or swallowing, or by pressing upon the tragus, particularly when the jaw is open. The beating of the carotid is distinctly felt in the ear, and each throb of the artery, particularly if the circulation be excited, increases the suffering. There is also a feeling of fulness, and bursting within the organ frequently; with this, there is pain and soreness over the side of the head, in the teeth, in the eye and temple, and in the superior lateral triangle of the neck; with occasionally stiffness and soreness of the upper portion of the mastoid muscle, and often flying, rheumatic pains throughout the body, particularly in middle-aged persons, and those who have previously suffered from rheumatic attacks. If neglected, or unrelieved by treatment, the pain extends to the throat and mastoid region, and is increased on pressing the mouth of the Eustachian tube with the finger. The severity of the pain experienced is to a certain degree a test of the extent of the inflammation; and the peculiarity of the pain is also a means of judging of the exact seat of the inflammation. If pain is experienced in swallowing, mastication, or sneezing, &c., we may presume that the inflammation has extended to the middle ear.

A very curious impression exists among, and is too frequently acted on by the profession, that ear-ache is a *neuralgic* affection. To this very general mistake must we attribute the practice, so frequently and empirically resorted to, of pouring into the ear the various nostrums, sedatives, and stimulants, calculated to allay pain in external parts. So rare is true neuralgia of the ear, that Dr. Kramer says, he "never observed ear-ache without evidence of inflammation either of the meatus or of the membrana tympani;" although I am not prepared to say that such an affection does not occasionally exist, I must say that I cannot, at this moment, tax my memory with a single instance

of so-called "nervous otalgia," for which I have been consulted, that upon a careful examination I could not discover some direct *visible* cause for it: and I must, therefore, with Dr. Kramer, "deny to those persons the right of pronouncing a decisive opinion on the existence of a nervous otalgia, who do not understand investigating the membrana tympani in bright sunshine, and with the aid of the speculum, and who are not in the habit of doing it."(*a*)

Usually coincident with the seizure of pain, the patient complains of *tinnitus aurium*, and the noises to which this symptom is compared are as various, and the accounts given of them even more incongruous, than those of muscæ in the eye, to which, in some instances, they bear an analogy. These consist of a dull throbbing, or pulsation,—a loud pumping like that of a steam-engine,—with the occasional supervention of a noise, varying in loudness and intensity from the ticking of a watch to the striking of a loud clock; but the most usual simile given by patients in describing those ear-noises is that tidal sound perceived on holding a conch-shell to the ear. In the severer forms of aural inflammation, patients very frequently liken this unpleasant symptom to the falling of water, the dashing of a cataract, or that peculiar rushing sound produced by the sudden escape of water through a large pipe or sluice-gate. In the more mitigated forms, and the more advanced and chronic stages of these aural inflammations, we generally find the sounds of a hissing or blowing character, and usually likened to the singing of a kettle, the noise of a distant storm, the fluttering of the leaves of trees, the chirruping of birds, the distant ringing of bells, a dull cooing in the ear, musical sounds of various kinds, the buzzing of bees, blowing of a bellows, whistling, and other noises of a similar character, for which the fer-

(*a*) Not long ago, a practitioner, relating to me the history of a case of typhus fever which had proved fatal to a mutual medical friend, summed up the symptoms with the enumeration of "abscess of the base of the brain," because he had discharge from the ear, although neither the ear nor the contents of the cranium were examined!

tility of the patient's imagination finds a ready similitude. Any increase of the circulation, or nervous excitement of any kind, particularly in chronic cases, invariably makes these ear-noises worse. We would earnestly call the attention of those engaged in the study of aural diseases, to the subject of tinnitus, as it is more than probable that a knowledge of the peculiarities of this symptom may yet be found to assist in the diagnosis of particular forms of deafness.

Deafness,—consisting either of impaired hearing or total loss of that sense on the affected side, coming on either contemporaneously with the pain, or succeeding it in a few hours after. If, however, but one side has been attacked, the patient is not at first conscious of his loss of hearing. In some rare cases there is for a short time during the progress of tympanal inflammation an exaltation of the sense of hearing, in which (like photophobia in ophthalmia) all sounds become intolerable.

To these local subjective symptoms may be added the following constitutional ones: increased heat of skin, headach with a feeling of weight in the head, sometimes well-marked hemicrania, great distress and anxiety of countenance, sneezing, coughing, and other symptoms of catarrh, sleeplessness, restlessness, some quickness of pulse, occasionally rigors, in some instances delirium, and even, in very bad cases, all the symptoms of cerebral disease, of which Case II. is an example. The digestive organs are seldom much engaged in the progress of the disease; the urine becomes high-coloured, and, towards the termination of the acute symptoms, deposits a copious pinkish sediment. The circulation, except in very severe cases, is seldom much affected.

The objective symptoms, or physical signs, consist, in the severe cases, of heat, pain, and slight erysipelatous redness of the auricle: in very aggravated cases, heat, fulness, and œdema, as well as pain over the mastoid region: in ordinary cases, slight tumefaction of the lining of the external meatus; complete cessation of the cerumenous secretion; a bright pink-

ish colour, and a swelling and polish of the membrane lining the auditory canal, which is streaked with long tortuous vessels: accompanied by heat and itching of that part.

The membrana tympani first loses its polish, then its semi-transparency,— becomes in the early stages, and in very mild cases, of a dull yellow, but this is variable and seldom seen; the most usual colour varies through all the shades of red, from a slight pinkish hue to that of a dark damask rose tint, and is caused by the different degrees of vascularity produced by the greater or less intensity of the inflammation. Soemmerring has faithfully represented the arteries of the tympanal membrane in the normal condition as two long vessels proceeding from above downwards and backwards along the course of the handle of the hammer, and branching on either side into the anterior and posterior vibrating thin portions of the membrane. During inflammatory action, however, like as in the coats of the eye, new vessels seem to start into existence, and to branch and inosculate till the whole seems one mass of bright or livid red. Generally speaking, the upper portion around the attachment of the head of the hammer is the first to become vascular, the last to regain the natural hue, and the part in which the colour becomes deepest. The vessels along the handle of the hammer are always well marked, though the line of attachment of that bone remains for a long time whitish, owing to the intimate connexion of the membrane to it at this part. Around the circumference of the membrane, within the ligamentous ring, particularly at its lower and anterior part, an areola of short vessels form a circle of almost a line in breadth; they all run towards the centre, and, when well marked, look like the zone seen in iritis, or, which is perhaps a better simile, the zone observed in the cornea in the commencement of cornitis, to which disease the appearances seen in myringitis bear a great resemblance. It is only in the early stages, or when the redness is disappearing, that this peculiar peripheral vascularity is well-marked. With this general

redness may in some cases be seen well-defined patches of ecchymosis, generally on the anterior vibrating portion; and as the vascularity increases, even the exact position of the manubrium cannot be recognised,—all is one red mass. The membrane also becomes swollen, and its surface apparently villous; rarely vesicles, and still more rarely pustules and small abscesses, form on its surface. Ulcers occasionally form upon it; these usually occupy the anterior part of the lower vibrating portion, but I have occasionally seen them situated posteriorly. It is possible that they may have commenced as vesicles or pustules, but we require more extended and minute observations to determine this point. Exudation of mueo-purulent secretion, with detachment of the cuticle, both from the surface of the membrane and the parietes of the canal; perforation of the tympanal membrane, either by rupture, abscess, slough, or ulceration, but which it is not always easy to determine, also occur occasionally. The rupture usually takes place in the anterior portion, and close to the opening of the Eustachian tube; sometimes it may be seen as a round or oval hole, about the size of No. 8 shot, and appearing as if punched out of the membrane. In other instances the rupture takes place at the anterior inferior edge of the membrane, in which case the lower margin of the aperture is formed by the parietes of the canal, and cavity of the tympanum. In still rarer instances the rupture takes place in the posterior division of the membrane, below, and somewhat behind, the point or handle of the malleus.

In this condition, with the cavity of the tympanum open, polypoid growths occurring in the meatus, and granulating over the surface of the tympanum and its membrane, and a copious and very often fœtid discharge pouring both from the auditory passage and the drum, the case becomes one of otorrhœa, the peculiar symptoms and management of which I have already detailed in my former Essay.

Besides the peculiar vascular condition of the membrane

already referred to, lymph is very frequently effused between the laminæ, in the substance of its proper fibrous tunic, and there can be little doubt that, in the severe forms of the disease, this morbid product is poured out in large quantity upon the surface of the tympanum, the membrane of which must partake largely of the inflammatory action so visible in the external septum. That these lymphy exudations,—both by thickening the tympanal membrane itself, and by acting in a similar manner upon the lining of the cavity of the tympanum and the parts contained within it, by bands of adhesion within its walls thus drawing inward and arresting the vibrations of the membrana tympani, curtailing the motions of the ossicula, injuriously affecting the membranes of the fenestræ, and particularly by impairing the functions of those tympanic branches of the glosso-pharyngeal nerves which ramify on the mucous membrane,—are the principal causes of deafness, I have little doubt.

When rupture takes place, and that accumulations of blood, mucus, or purulent matter, pent up within the tympanum, are evacuated, relief is generally experienced.

In cases where neither rupture nor ulceration has taken place, as the disease advances, the vascularity of the tympanic membrane decreases, first in the centre of its vibrating portion, then around its circumference, and finally along the mallear attachment. The membrane assumes a muddy, yellowish, opaque colour; after this clears off we find it opaque throughout, or in spots; sometimes these opacities can be plainly discovered upon the interior of the membrane, like the speckled opacities seen upon the membrane of the aqueous humour. In other cases, the result of the inflammation is seen in the uniform greyish-white opacity, similar to leucoma of the cornea; and in time, as the superficial polish is restored, the membrane presents a pearly aspect very different from the semi-transparent character of the healthy condition.

A not uncommon effect of inflammation of the tympanum

and its membranes, particularly when allowed to run its course unchecked, is a drawing inward of the membrana tympani. In such cases the handle of the hammer forms the most projecting point seen at the bottom of the auditory canal; and the anterior and posterior divisions of the membrane can be distinctly seen forming deeply curved folds upon either side of it. At times the membrane can be elevated to its natural position by inflating the drum through the Eustachian tube; but in such cases, as soon as the pressure from within is removed, it immediately resumes its former position. Considerable discussion has occurred among authors as to the possibility of collapse or falling inward of the tympanal membrane, occurring from shocks or loud noises, &c. This is not the place for investigating that question, but of the existence of the pathological condition which I have thus described, and of its being sometimes the consequence of inflammatory action, I have no manner of doubt. It is a peculiarity I demonstrate to the class at the hospital daily. Mr. Toynbee's dissections confirm my observations on this point, and, in some instances, explain the cause, namely, adhesive bands existing between the back of the membrane and the inner wall of the tympanum.

In anatomical preparations, however, it must be remembered that it is the position that the parts are most likely to assume; and, moreover, it is not an uncommon peculiarity even in persons who have never suffered from any affection of the ear, *of which they were conscious*, and who were not aware of their hearing being in any way impaired until tested by the watch.

The inflammatory process must, in severe cases, also extend into the mastoid cells; the periosteum lining the bony portion of the auditory canal will in time become engaged, as well as the pericranium over the mastoid process, and post-aural region of the skull, and present the appearance, already described. If allowed to proceed unchecked, either by the efforts of nature or art, the death of the bone beneath will follow; while, in cases still

more severe, the entire petrous portion of the temporal bone will become inflamed,—the dura mater will separate from it,—purulent deposit takes place in the cavity thus produced,—the brain, as well as its investments opposite those portions, will partake of the inflammation,—and death follow, either from abscess or diffuse inflammation of the cerebrum or cerebellum.

During the progress of the inflammatory action in the tympanum and its external membrane, the throat, in some cases, becomes engaged, its mucous membrane presenting a copperish red appearance, and becoming swollen and infiltrated. The tonsils also become swollen; there is some difficulty of deglutition; and if an examination of the pharyngeal extremity of the Eustachian tube be made with the finger, according to the method described at page 15, considerable pain is experienced in the track of the tube, as well as in the middle ear. There can be little doubt of the inflammatory condition of the middle ear, extending over the Eustachian tube, and causing such thickening and obstruction of its lining membrane, with, perhaps, an accumulation of mucus, as greatly impedes the transit of air into the drum, and causes that peculiar feeling of stuffing, and occasional sudden bursting in the middle ear, of which we are all conscious when labouring under influenza or catarrh.

The nose sometimes partakes in the unhealthy condition of the neighbouring mucous membrane, and the feeling of stuffing in that part, together with much faucial respiration, is not an uncommon attendant upon acute inflammation of the middle ear and membrana tympani.

In some rare cases, paralysis of the muscles of the face, on the affected side, presenting all the peculiar phenomena of that disease, is produced; an instance of which will be given in one of the cases (although in the chronic form) to be related hereafter. I am strongly inclined to think, that many of the cases of paralysis of the seventh pair of nerves, where we have no mechanical lesion, such as caries or exfoliation,

and which heretofore were usually attributed to cold, &c., may have been caused by some form of otitis; and I would therefore beg to direct the special attention of physicians to the peculiar condition of the ear in all such instances.

This form of inflammation chiefly attacks the young and middle-aged; one ear is much more frequently affected than both; the light-haired and fair-complexioned are more liable to it than the dark. So much more frequent are its attacks in spring than at any other period of the year, that it sometimes seems to be epidemic at that period. The duration of the disease varies from six to fourteen days, but may last a month, and its effects several months.

TREATMENT.

The temperature in cases of acute myringitis should be strictly attended to; the patient should, if possible, be confined to a warm well-ventilated apartment, or if obliged to go abroad, the cold air should be carefully excluded from the ear; but in the severe form of the disease it is absolutely necessary to confine the patient to bed.

Depletion is strictly enjoined, but I have seldom found it necessary to resort to general bleeding. Local depletion is imperatively required, either by cupping or by leeches: the former is not easily managed so near the part affected as to be of much service; in cases, however, of very severe internal otitis, it may be had recourse to, and a dextrous cupper will abstract several ounces of blood from the soft parts immediately behind and beneath the mastoid process; and if the head be much engaged, blood may be abstracted by the same means from the nape of the neck. Leeches are, however, the most effectual means of abstracting blood and relieving pain in all such cases. They should not, however, be applied in the usual manner behind the mastoid process: to be of service they must be applied with a leech-glass immediately around and within the external meatus; in the fossa behind the tragus, and, if necessary, in front of that pro-

minence, in the hollow formed by depressing the jaw(*a*). From four to six leeches may be readily applied around the meatus, and in this situation they will produce more permanent and immediate relief than three times the number affixed over the mastoid region. The application in front of the tragus is also very much more effectual than upon the mastoid region. When, however, the latter locality becomes itself the seat of inflammatory action, they should also be applied freely all over it. Where we have already recently applied leeches in the two first-mentioned localities, and that the parts have thereby become swollen and irritated, the next most advantageous position is beneath the lobe of the auricle, behind the ramus of the jaw. I do not know any painful affection in which leeches applied in the manner directed produce the same amount of immediate relief, as in the disease under consideration. They should be had recourse to again and again, even upon the same day, to relieve paroxysms of pain, as well as to lessen the degree of redness and vascularity observable.

The application of heat and moisture is particularly grateful in such cases; steaming the ear by holding it over the vapour of some very hot water placed in the bottom of a long, narrow vessel, medicated with hyosciamus, opium, belladonna, or with the ordinary decoction of marshmallows, camomile, or poppy-heads, if faith be placed in such, gives great comfort. The Russians employ a peculiar apparatus for relieving pain in the ear, consisting of a funnel-shaped roll of linen, the small end of which is applied to the meatus, while the large end, in which various balsamic substances are placed and set fire to, is allowed to burn down slowly like a moxa. A warm linseed-meal poultice renewed every two or three hours, and particularly applied at bedtime, gives great relief. Stupes and fomentations are not, I find, as efficacious in aural as in ophthalmic inflammations.

(*a*) A morsel of cotton should be inserted into the auditory canal before applying the leeches; this prevents their going in too far, and also excludes the blood, and keeps it from collecting and clogging within the passage.

The bowels should in this, as in all other febrile diseases, be opened, but the condition of the digestive organs does not appear to influence the inflammatory affections of the ear as much as they do those of the eye. The state of the skin, however, which is generally hot and dry, requires our more especial attention; and sudorifics are, in the early stage of the disease, decidedly indicated. Having leeched, fomented, and, if necessary, purged, James's Powder, combined with small doses of blue pill and henbane, will be found very efficacious. Abstinence from animal food, and the use of the pediluvium, together with all such means as are calculated to allay inflammation and febrile excitement, should be had recourse to.

Counter-irritation, by means of small blisters applied upon the bald space behind the auricle, and below the lobe, are advantageous in the more advanced stages of the disease, and after local depletion has been fully employed. Generally speaking, blisters are too much relied upon, or applied too early in the disease; but as it advances they will be found highly useful, and the surfaces which they expose may with advantage be dressed with mercurial ointment.

Having resorted to all those means, we should, if the symptoms,—not only of pain and deafness, but of the redness and vascularity of the tympanal membrane,—remain unrelieved, at once have recourse to the use of mercury. Indeed I am now so fully convinced, not only of the utility, but of the urgent necessity of employing mercury in these aural inflammations, that I do not hesitate to recommend its use in the early stages of all such affections. A pneumonia, a pericarditis, an inflammation of a large joint or a serous cavity, an iritis, or other form of internal ophthalmia, may, it is true, get well by simple depletion, &c.; but will any experienced practitioner of the present day risk such a case without having recourse to mercury? For the reasons applicable in these instances; from the peculiar effect which mercury exercises, not only in most inflammations, but especially over those of fibrous membranes; and in order to

arrest the exudation of lymph, and to cause the absorption of those effusions which, by thickening the membranes, and causing those pathological effects to which I have already so frequently alluded, and which prove so constantly the cause of subsequent deafness,—as well as the urgent necessity for arresting the progress of inflammation in a part that may prove destructive to life,—it is, that I so strongly advocate the employment of this remedy. I find that, in most instances, where it is employed early, it produces, as soon as it affects the system, as well-marked an improvement in all the symptoms as it does in any of the other inflammations which I have enumerated. It should, therefore, be given in small, frequently-repeated doses; and the formula I find most efficacious is calomel and blue pill, guarded with opium, and, if the stomach will bear it, a very small quantity of James's Powder. Not only should the gums be touched, but the patient should be kept under its gentle influence for some days, in order to insure an ultimate beneficial result.

In the subsequent management of the disease, the iodide and bromide of potassium, or very minute doses of the bichloride of mercury, in some of the preparations of bark, will certainly hasten the cure, as well as promote absorption of the deposits and adhesions already alluded to. The treatment of the tinnitus which remains shall be considered under the head of the chronic form of the disease.

Under no circumstances should we pour any stimulating or sedative liquors into the ear(*a*). The state of the part

(*a*) From the frequency of this most unjustifiable practice in this country, I feel I cannot too strongly deprecate it. If there is one substance more irritating than another in the Pharmacopœia, it is poured, *secundum artem*, into the ear, to relieve pain, or cure deafness, to lessen or to increase the secretion of wax! This practice is often the cause of myringitis. Why are not these essential oils, stimulating liniments, this turpentine, creosote, tincture of cantharides, oil of origanum, &c., poured into the eye or injected into the urethra in cases of inflammation of these parts?

should be examined with a speculum daily, or oftener if necessary; and then, should we discover an ulcer, it may be touched with a solution of nitrate of silver applied upon a fine camel's-hair pencil. If otorrhœa has occurred either from mucous discharge from the external surface of the tympanal membrane and the auditory canal, or owing to pus or mucus escaping from the middle ear through an aperture in the membrana tympani, or from an abscess occurring in the walls of the external auditory canal, we should remove the discharge by very gently syringing the part with simple warm water, or the most bland, unirritating fluids; but during the high inflammatory process no astringent injections whatever should be employed.

If polypoid growths of any magnitude sprout suddenly from the auditory canal, they should be removed with the snare; and this, if properly done, does not give rise to any fresh attack of inflammation.

Should the mastoid process, or the parts covering it, become engaged, and that the methods already recommended fail to give relief, or that even an indistinct sense of fluctuation can be discovered, we should not long hesitate to make a free incision in the periosteum there, at least an inch in length. In performing this operation the head should be firmly secured, and supported against some unyielding substance, as the back of a high chair or the breast of an assistant. A stout scalpel is the best instrument to employ; it should be grasped so that the fore-finger and thumb may come down upon the blade, so as to leave about an inch of it uncovered. It should be inserted steadily till the point reaches the bone, which it should be made to traverse, for the full length of the incision. By this means we secure complete division of the periosteum. With regard to the line of the incision, circumstances may require its being made in other directions, but I find that it is most generally required parallel with, and about an inch from the attachment of the auricle. The knife should be drawn from below

upwards; and from the swollen state of the parts, the depth which we are sometimes obliged to introduce the instrument is often nearly an inch. The hæmorrhage, unless we wish to extract blood, may be arrested by placing a dossil of lint within the incision. The cut surfaces generally present the brawn-like appearance seen in phlegmonoid erysipelas. Although pus may not have been reached by the incision, still immediate relief is almost invariably experienced. The subsequent management of this particular part of such a case must depend upon the circumstance of exfoliation, &c. The treatment of the chronic form of the disease shall be considered in the subsequent part of this communication.

The following cases exhibit many of the phenomena detailed in the foregoing description. They are given at somewhat greater length than would be necessary, were the diseases of the ear as much attended to by the general physician or surgeon as they ought, or if the treatment of these diseases formed a part of the present system of medical education in these countries.

Case I.—*Acute Myringitis and Tympanitis*(*a*) *in both Ears, with severe Head Symptoms; Recovery under the use of Mercury.*

Master J—, aged 12 years, with light hair and florid complexion (whose elder brother had been under my care a short time previously for chronic inflammation of the left, and acute inflammation of the right ear), had always enjoyed good health, and never had any aural affection, till Sunday, the 1st of August last, when he was attacked with slight pain in the right ear. Upon the Friday previous he had bathed in the open sea five times, and had dived frequently each time. Upon the day following he bathed three times, and also dived. He awoke on Sunday morning early with some pain in the right ear, but

(*a*) By the term myringitis we understand inflammation of the membrana tympani; and by tympanitis, inflammation of the cavity of the tympanum.

made no complaint of it, as he says it was but slight; it was accompanied, however, by a feeling of pressure, as if something was bursting out through the ear. He bathed, however, again, twice upon that day. Towards evening pain came on in the left ear, and increased greatly in the right. He retired to rest early, and having been reminded of the provocation for his pains, he made no further complaint. About twelve o'clock that night, however, his mother was awoke by his cries and moans, the result of the extreme agony which he was then suffering. A neighbouring practitioner was applied to, and some camphorated oil and laudanum dropped into the ear. This treatment, however, afforded him no relief, and he remained awake all night, moaning much, and complaining of the violent pain in his head and ears, which he likened to a sharp instrument penetrating from without.

I saw him on Monday morning, the 2nd, about ten o'clock; the face was flushed, and the countenance anxious and expressive of extreme pain. The pupils were rather more contracted than natural, and the eyes slightly sensitive to light; he had some heat of skin, but the pulse was not above 76; the bowels were constipated, and the urine natural. Upon examination the auricle and external meatus were found natural; considerable pain was experienced upon pressing the cartilage behind the articulation of the jaw, but pressure over the mastoid region was borne with impunity. Upon introducing a tubular speculum into the external meatus, the auditory canal was found of a light rose-colour, quite dry, and devoid of cerumen; the membrana tympani was distinctly seen of a deep pink colour, generally diffused over it, but increasing in intensity in a crescentic form round its lower insertion, and also in the line of the attachment of the malleus. The appearances were nearly the same on both sides. As this boy was brought to my house I had a better opportunity of accurately recording the state of the parts than one is usually able to effect in the sick chamber. The appearance of the throat was

normal; the finger pressed against the mouth of the Eustachian tube caused but slight increase of the pain. Moving the articulation of the jaw, the act of deglutition, mastication, or coughing, were scarcely attended with any aggravation of the symptoms. Pressing air through the Eustachian tube, by holding the mouth and nose, and making a forced expiration, was also unattended by any unpleasant symptoms, but it passed up with great difficulty. Hearing then unimpaired.

He was ordered to be put to bed; to take a purgative bolus, and to have two leeches immediately applied to the posterior margin of the external meatus, as far in as possible, on both sides. The leeches afforded some relief, but towards evening the pain returned with great violence. He became quite delirious about six o'clock; did not know his friends; and could with difficulty be retained in bed. I saw him about eight o'clock; he was then in high fever, but more sensible; there was great heat of skin; pulse 80, and fuller than in the morning; tongue clean; bowels had been fully opened; made water freely; urine limpid; no thirst; knows all his friends now, but does not pay much attention to what is going forward about him; is quite rational when spoken to; complains of intolerance of light; face has become more flushed and anxious; complains now of the great weight of his head, which he rolls about from side to side; has had no sleep. On examination I found that the redness of the passage and membrane of the drum had greatly increased since morning, but there was no tumefaction of either. Pressure or percussion of the mastoid process, and the infraaural region, was borne without wincing. Two more leeches were ordered to be applied over the articulation of the jaw, in front of the tragus upon each side, and small doses of calomel, opium, and James's Powder to be administered every third hour. The ear to be steamed over hot water, and a linseed poultice to be applied subsequently: scarcely any diminution of hearing.

Tuesday, 3rd. Has passed a sleepless night, raving occa-

sionally. All his previous symptoms continue unabated, in addition to which, he now, for the first time, complains of noise in his ears, which he likens to that of the sea or tide. This noise is, he says, generally diffused through the head as well as in the ears. The pain is somewhat increased. He says he feels as if a lance was running into his head; bowels free; gums and breath unaffected by the mercury: blisters ordered to be applied behind the ears upon both sides. During the night of Tuesday he again became violent, and did not know his friends. The urine became remarkably dark-coloured. He had no sleep. The mercury was steadily persevered in, and towards morning he complained of some soreness of his mouth and gums.

Wednesday, 4th. Countenance less anxious; pulse not so full; pain in ears and head very much less; mouth slightly sore; complains of pain in swallowing, which he refers to the middle ear; has now become very deaf, and complains of increase of noise; this noise he describes as now of two kinds,—a continuous, uninterrupted bellows sound, and an occasional ticking, like that of a loud watch, which commences and stops suddenly; passed another sleepless night; raved occasionally; pain has very much lessened; membrane and passage unaltered: interval between doses of mercury increased.

Thursday, 5th. He is much better in every respect; he has had no delirium since last report; lies quiet on his side; the light is still offensive to him; skin cooler; pulse 80; bowels free; mouth very sore; deafness still continues; noise in head not so violent; urine high coloured: mercury stopped. The membrana tympani and auditory canal are much less red; the occipital region was ordered to be shaved, and two small blisters to be applied behind the insertion of the mastoid muscles. On Thursday night he was remarkably tranquil, and had some sleep. His chief complaint now is of the soreness of his mouth from the effects of the mercury.

Friday, 6th. At eleven o'clock this morning he was sud-

denly attacked with acute pain in both ears, of a sharp lancinating character. Leeches were again applied round the meatus on both sides, and warm stupes and fomentations again had recourse to. These means afforded him relief in a short time.

Saturday, 7th. Has slept well during the previous night; has had no return of the acute pain, but a dull aching still continues in both ears; he is very deaf to-day, but he is not so sensitive to light; the bellows noise still continues in his ears, and that which was formerly described as the ticking of a watch, he now likens to the clapping of two pieces of iron together. He only hears an ordinary ticking watch when it is pressed against the auricle of the left side, not at all on the right; he does not hear it when applied to the forehead, or held between the teeth, and but very slightly when applied upon the mastoid process. He complains of a return of the weight in his head to-day; sleeps much; bowels free; urine of a dark brown colour, and depositing a pinkish sediment; mouth very sore. Upon the visit at four o'clock in the evening the countenance was found more tranquil than on any previous occasion; the skin cool; pulse 75; functions natural: pressure on the tragus is now borne with impunity. Upon inspection the membrana tympani was found much less red, particularly on the left side; it is also beginning to clear above the malleus; mouth still very sore; ordered a gargle, and to have light broth.

Monday, 9th. Much better in every respect. A slight muco-purulent discharge now appears from the meatus of the right ear. On removing this with a little tepid water from a syringe, and bringing the membrana tympani within the field of the speculum, the redness was found to have greatly disappeared, except on two or three spots, about the size of pin-heads; all the intermediate portions of the membrane had become white, and apparently thick and pulpy. Upon the left side there is a slight moisture from a mucous discharge, which coats over the surface of the membrane of the drum, and the inferior portion of the wall of the canal. Having removed this with a little

cotton on a probe, the vascularity which had previously appeared on those parts was found to have greatly diminished; but the membrane itself had become thickened and opaque; he is quite free from pain; the hearing distance has increased to about two inches on each side; ordered three grains of the hydriodate of potash three times a day, and nutritious diet. On the right side two small glands have now appeared beneath the lobe, and another slightly enlarged over the mastoid process.

Thursday, 12th. Has very much improved in every respect since last report; is now quite free from fever, but is very weak and languid; tongue clean; soreness of mouth quite removed; pulse 60; has some appetite; sat up for a short time yesterday; glands in the neck much lessened, that over the mastoid process still tender; is quite free from pain in the ears, but still complains of a slight, generally-diffused pain in his head; there is no intolerance of light; hearing distance has increased to eighteen inches on each side; has had no discharge from the ear since; the loud ticking noise has quite disappeared; but the buzzing or bellows sound is still slightly perceptible; any surrounding noise is particularly distressing to him; he says he feels as if it struck his ear. Upon examination of the right ear, the passage is found to be quite dry, and of a light pink colour; the membrana tympani generally is somewhat redder than on the occasion of my former visit; and, besides this generally diffused redness, there is a deep-coloured ring of vessels to be seen, forming a excentric band about a line in breadth, occupying the lower portion of the membrane, the vessels of which can be distinctly seen running in nearly straight lines from the circumference towards the centre, very similar to some of the forms of corneitis. The projection of the hammer-bone is marked by a fasciculus of dark red vessels, running along the course of its attachment. In the left ear the general redness of the passage and the membrane is not so great, and there is no ring of vessels such as exists upon the right side. He states that, on Tuesday, on blowing his nose, he felt as if some-

thing gave way in his right ear, and that immediately his hearing increased, and on repeating the experiment a few times, the same phenomena took place in the left ear. Since then his hearing has gradually improved to the present time; he was ordered to be blistered again behind the ears, to continue the use of the potash, to sit up for a few hours every day, and have nutritious diet. His functions are all natural, and he sleeps tranquilly through the entire night.

Monday, 16th. Has continued to improve; hearing has increased to three feet upon the right, and four feet upon the left side. Upon examination the right membrana tympani is found much less vascular but somewhat more opaque than the left, which is still of a uniform pinkish colour, but has, nevertheless, regained its polish and semi-transparency much more than the other. The buzzing noise is still slightly felt. The blisters were repeated, and the potash, with tincture of iodine continued; slight open air exercise permitted.

Wednesday, 18th. From the general improvement in his health, he was enabled to visit me at my house on this date. He states that he is now quite well, but is still weak; he looks pale and thin; the buzzing, and all other noises, have completely disappeared. The membrana tympani on the right side is found to have lost much of its vascularity, but is uniformly opaque, and is also dull upon its surface; with this ear the hearing distance is now four feet(*a*), whereas with the left, which is still very vascular, but much more transparent, the hearing distance is now full six feet. A generous diet and the potash and iodine ordered to be continued.

Sept. 25. His general health is now quite restored; his hearing as good as ever; the noise has entirely disappeared. During the past month a blush of redness has several times appeared upon the left membrana tympani. Still his hearing

(*a*) The same watch having been used in this and all the other cases in the report, the comparative amount of difference in hearing is correct.

distance with that ear is somewhat greater than on the right side, in which the membrane is not vascular, but slightly opaque. Occasionally leeching, blistering several times, and the use of the iodine and potash internally, have now completely restored him.

The constitutional symptoms in this case were more than usually severe, and such as might lead the practitioner to suppose the brain or its membranes engaged. We also learn from this case that inflammation of the tympanum and its membrane may produce such a degree of deafness as that the watch cannot be heard, even when *applied* to the ear.

In all probability the inflammation commenced and was originally confined to the tympanal membrane, and afterwards extended to the middle, and, possibly, the internal ear.

From the latter stage of this boy's case we also learn a fact worthy of observation, namely, that it is not the amount of vascularity, but the degree of thickening and opacity in the membrana tympani, which produces the deafness.

Case II.—*Acute Myringitis and Tympanitis of one Side; Immediate Recovery under the Use of Mercury.*

Catherine Lawlor, aged 21, applied at the hospital at ten o'clock on the morning of the 18th of April, for an attack of intense pain in her right ear. She states that she has not been "regular" for the last six weeks; that she was attacked four days ago with catarrh, attended with considerable stuffing in her nose, and the other usual symptoms of that affection; that she had walked along the sea-shore the day before, with a cold wind blowing upon her right side. She went to bed tolerably well last night, but awoke at three o'clock this morning with a violent beating pain in her ear, accompanied by a loud noise, which she likens to the "puffing of a steam-engine;" the pain resembles that of a sharp instrument penetrating through her ear into her head, which she describes as most excruciating. She had also some pain and soreness over that

side of the head; she felt some difficulty of deglutition, owing to the pain it caused her. Coughing, sneezing, or any motion of the temporo-maxillary articulation, greatly aggravated her sufferings, and gave her a feeling of bursting in the middle ear.

She rose at seven o'clock, felt great sickness of stomach, and had a well-marked rigor whilst dressing. She immediately applied to a neighbouring practitioner, who put some drops with a piece of cotton into her ear, which only aggravated her symptoms. These drops appeared to be oil and laudanum. 11 o'clock, A. M. Her pain still continues, and the noise has increased; there is slight redness and great heat of the auricle. The pain is increased on making pressure over the tragus in front of the meatus; on pressing or percussing the mastoid process slight pain is also complained of. The pain in her ear, however, is not increased by these means, nor is it referred to the tympanum. She has no pain beneath the meatus, nor behind the angle of the jaw. The hearing distance, with an ordinary ticking watch, is scarcely three inches in the right ear. On closing the meatus of the left side the noise is greatly increased. On examination with a speculum the auditory canal is found highly vascular, dry, devoid of cerumen, and exceedingly tender to the touch. The membrana tympani has lost its polish, and is of a bright, florid, generally-diffused red colour, spotted with small patches of a deeper hue, like minute ecchymoses. The projection of the malleus can be recognised, of a darker colour than the surrounding parts, with a whitish line in the centre. Below the malleus, and towards the posterior part of the membrane, a well-defined vesicle, about the size of a grain of mustard seed, and filled with a brownish fluid, can be seen. Upon her holding the mouth and nose, and pressing the air into the Eustachian tube, she experiences considerable difficulty in making it pass up upon that side, while it passes with facility into the tympanum of the left. The ear, or a stethoscope held to the right side during this operation, readily perceives

as soon as the air reaches the tympanum, a squeeling and gurgling sound, as if the air passed not only through a narrow passage, but through a fluid like mucus. This pressure of air into the tympanum greatly aggravates her symptoms.

Upon looking into the mouth, the fauces, uvula, and back of the pharynx are found nearly of their natural colour. Upon inserting the forefinger of the right hand into the mouth, and pressing its point upwards, backwards, and outwards, towards the mouth of the Eustachian tube, considerable increase of pain is experienced in the middle ear. The tongue is coated and flabby; the pulse regular; but there is heat of skin, and considerable anxiety of countenance. The left ear is natural in function and appearance. This patient suffered from rheumatism of the upper extremities some time ago.

Four leeches were applied around the meatus, as far in as possible, and four in the depression in front of the tragus. She was ordered to foment and steam the ear over hot water, placed in the bottom of a long, narrow mug, frequently during the day; and a purge was administered.

April 19th. States that she received immediate relief from the leeching. The countenance is less anxious, and she slept well all night; the noise of a steam-engine is altered to a gurgling sound; the pain and all other symptoms are relieved; the membrana tympani, however, remains nearly the same in colour, but the vesicle has become flaccid. She was put on the use of calomel and opium in small doses frequently repeated; a blister was applied over the mastoid process; the fomentation and warm vapour was ordered to be continued, and a linseed-meal poultice to be applied to the external ear at bed time.

April 20th. Continues to improve. Noise changed to that of the ringing of bells; the pain, on pressing the mouth of the Eustachian tube, is much less; the membrana tympani is less vascular; the general symptoms are all improved; the mercury to be continued.

April 21st. All the symptoms relieved; the mouth is slightly sore; no pain on pressing anywhere around the ear or meatus; all heat and vascularity of auricle is removed; the membrana tympani has lost its vascularity, but is slightly more opaque, and whiter than natural; the vesicle has quite disappeared; three or four large vessels can still be seen coursing along the handle of the malleus. Upon forcing air through the Eustachian tube into the tympanum, a slight gurgling noise can be perceived in the middle ear, and of the peculiar sensation which it imparts the patient is quite conscious. During this operation and while the membrane is within the field of the speculum, a slight blush of redness, of a pinkish hue, is observed to be produced in the membrane. The hearing distance is increased to four inches. A copious red deposit was observed in the urine. She has been slightly purged by the mercury; ordered to lessen its dose to one pill night and morning.

April 23rd. Continues to improve in hearing; noise as before; she has had no return of pain in the ear; the pain and soreness in the head gone; no flying pains or other rheumatic affection; the mouth is very sore: ordered to stop the pills, and take the sixteenth of a grain of oxymuriate of mercury with decoction and tincture of bark three times a day; generous diet.

April 25. Continues to improve rapidly; membrana tympani is more transparent than upon last examination. Hearing distance is increased to twelve inches; slight pain is still felt on pressure over the lower portion of the mastoid process, and opposite the point of the styloid process, in which latter place it is still increased on coughing: ordered to continue the oxymuriate and bark, and apply another blister.

May 1st. Ceased attendance at the institution; all her symptoms having now disappeared, with the exception of a slight buzzing occasionally. The hearing, she says, is perfectly restored.

September 1st. I had an opportunity of examining this young woman again this day; she states that she is perfectly well in every respect, and that her hearing is quite restored; but she says that she occasionally suffers from a slight "ticking noise" in the ear which was affected. Upon examination I found the membrane of the drum upon this side presenting a slightly mottled appearance, particularly towards its lower edge, but without an opacity of any account. Her hearing, she says, is equally perfect on both sides; but upon testing it by the watch, the hearing distance is found to be two feet less upon the right side than upon the other.

Case III.—*Severe Rheumatic Inflammation of the Membrane and Cavity of the Tympanum, with Periostitis, Polypus, &c.*

Mr. F., aged 49, with light hair and fair complexion, had suffered several years ago from a severe attack of rheumatism, in which his heart was affected, caught while exposed to a cold wind upon the top of a coach during a long journey through England; since that period he has been very liable to catch cold, in the head particularly, when the feet were exposed to damp or a low temperature. These attacks of catarrh were characterized by violent fits of sneezing and running at the nose, &c.; latterly his sense of smelling became greatly impaired, and he perceived a stuffing in the right nostril which rendered him very uncomfortable. During the summer of 1846 he was attacked with cough, expectoration, and other symptoms of bronchitis, in addition to the catarrhal affection. Having recovered from this, he remained in good health till January, 1847, on the 28th of which month, during a period of very wet and severe weather, his present attack commenced. His own words are: "About this period I wore a muffler about my neck; one sharp morning I walked into my office, laid it aside on my arrival, and, being called off suddenly to the Four Courts, I forgot to put it on again. On my way there I felt a blast of sharp, cold air strike my throat on the right side, under the ear, but I

did not pay much attention to it, and remained in Court most of the day, with my hat off occasionally. About 2 o'clock I felt a slight pain in the right ear, and got a bit of cotton-wool put into it; about 6 o'clock I returned home from my office. I called at my apothecary's, who dropped some warm oil and laudanum into my ear, which for a time lessened the pain, but did not completely remove it; but I was enabled to resume my business as usual next day."

Mr. Collins, to whom Mr. F. first applied, writes to me as follows: "When Mr. F. first called upon me he complained of pain in his right ear, and also of slight shooting pains about that side of the head; he looked a little dull and heavy, but there was no fever, quickness of pulse, headach, deafness, or other symptoms of importance present. I considered his attack to be of a rheumatic or neuralgic character, particularly as he had suffered a few years before from severe rheumatic fever; and as the pain in the ear was what he most complained of, I dropped some tincture of opium and olive oil into it, and applied a bit of wool to prevent its coming out; I also ordered him an aperient. Upon the next evening Mr. F. again applied to me on his return from Court, and stated that he had derived relief from the drops until he was again exposed to cold and draughts that day: the drops were again applied and with relief. The next day Mr. F. resumed his usual avocations, but the pain continued to increase, and four leeches were applied behind the ear, and a poppy fomentation and a poultice applied with considerable relief, though some slight pain still remained in the ear and the side of the head. His sense of smelling now returned and continued perfect for a few days, when it was again lost. Mr. F. confined himself to the house for the next two or three days, but would not consent to do so longer, as he felt much relieved of the pain, and business of great importance required his attention at his office. In a few days from this date his former symptoms returned, to relieve

which he was strongly recommended by a non-medical friend to drop into the ear a liniment of oil of turpentine and oil of cinnamon, which I prepared for him, but, having experienced no benefit from this, he applied to you."

I first saw this gentleman upon the 13th February; he complained of acute pain in his right ear, which, as appears from the foregoing account, had continued off and on during the previous fortnight. The pain he described as "shooting from the ear to the temple and top of the head, accompanied with a boiling and pumping noise, like that of a steam-engine;" the pain also appeared, according to his own description, to reach to the throat, without making the throat sore; it was increased by sneezing, but relieved by pressing the hand upon the ear and side of the head. Upon inspection, the auricle was found hot and somewhat swollen; the lining of the meatus and auditory canal was red, tumid, and completely devoid of cerumen; the introduction of the speculum, and the examination, caused a good deal of pain from the tenderness of the parts; the membrana tympani was of a dark, brown, red colour, had lost its polish, and appeared to be swollen and pressed outwards: the projection of the malleus could not be discerned in front of the ear; pressure in front of the ear gave a good deal of pain, but there was no tenderness over the mastoid process. Rest, abstinence, confinement to the house, constant fomentations, leeches round the meatus; with small doses of blue pill, James's Powder, and hyoscyamus, at night, and an aperient in the morning, was the treatment resorted to during the next few days.

Upon the 19th, his symptoms, with the exception of the pain in the ear, continued much the same; he had also flying pains of a rheumatic character in the side of the head, the wrists, feet, and generally throughout the body. The pumping and boiling noise remained unabated: the deafness now became complete upon that side. The appearance of the ear

continuing unchanged, except that the meatus was more swollen, it was deemed advisable to place him under the influence of mercury,—an opinion in which Dr. Stokes, who saw him with me, at that time concurred. He was accordingly, but with some difficulty, mercurialized by means of small and frequently repeated doses of blue pill, calomel, and opium. When his mouth became sore, the pain in the ear and the noise lessened somewhat, and the general rheumatic affection disappeared; but the meatus and auditory canal now became so much decreased in caliber, owing to the thickening of the lining of these parts, that it was not possible to gain more than a glimpse of the red and swollen membrana tympani. The leeching and blistering were continued, and the surfaces denuded by the latter were dressed with extract of belladonna and mercurial ointment.

March 10th.—The cuticle became detached, and a slight muco-purulent discharge took place from the external meatus; the ear was then syringed with plain tepid water; he was allowed a more generous diet, and placed upon the use of the hydriodate of potash, with infusion of bark and tincture of orange peel. His general health was now improved; he slept better, and was able to go abroad and take exercise; the discharge, however, continued to increase, and emitted a very offensive odour; and, at the same time, he began to complain of a deep-seated soreness all over the side of the head, behind the ear, but particularly over the mastoid process and immediately below it. Towards the end of March, upon examining the ear carefully under a good light, a small polypoid excrescence of a light red colour, growing from the posterior wall of the canal, and completely filling up that cavity, was detected; this I removed with the wire snare, and the discharge then lessened; the soreness of the side of the head, the pumping, and the deafness, however, remained the same. Pressure over the mastoid process, and the post-

aural region of the head, very much increased the soreness, and it was now evident that the periosteum covering these parts was inflamed. During the latter part of the month of April, and all the month of May, the symptoms of periostitis remained much the same, and the scalp itself became inflamed, having a dusky, red hue, pitting on pressure, and feeling excessively sore to the touch. The treatment consisted in the frequent abstraction of blood from the affected part by means of a few leeches, and a small cupping-glass applied over the leech-bites; poulticing, inunction with different ointments, both of a sedative and absorbent nature, slight vesicants, &c., and change of air. Bark, potash, and iodine, were also recommended to improve the general state of the constitution. He had no headach, rigors, or perspirations, and his sleep and appetite were tolerably good; still, however, the pain continued, and the dusky redness and tumefaction of the scalp remained, although there was no evidence of suppuration. It was determined, in consultation with Mr. Cusack, to make an incision down to the bone, and thus free the periosteum, and give exit to any matter which might be contained beneath it. Accordingly, upon the 29th of May I made a perpendicular incision, about two inches long, nearly parallel with the posterior margin of the auricle, by inserting a sharp-pointed scalpel down to the bone at the point of insertion of the mastoid muscle, and carrying it upwards and a little backwards. The bone did not feel rough or gritty under the knife. A pledget of lint was inserted into it; and when the hæmorrhage had ceased, a linseed-meal poultice was applied over it.

The wound suppurated kindly, and all the surrounding soreness of the scalp and pain on pressure soon disappeared. As the discharge from the wound increased that from the meatus lessened, and in about ten days the wound itself healed without any exfoliation of bone. The pumping noise now ceased altogether, the discharge from the ear also lessened very

much, and all uneasiness in the parts ceased. During the month of July, and till the 12th of August, I only saw Mr. F. occasionally. Upon examining the ear carefully at this latter date, I perceived that the meatus had regained its natural size, and I discovered another second small polypus in the situation of the first; this I also removed, and Mr. F. came to me in a day or two to inform me that the discharge had now ceased altogether, and that the hearing had returned the night after I had extracted the polypus. He could now perceive the ticking of a watch at the distance of an inch from his ear, although he was quite unconscious of it when pressed against the auricle the day I last saw him. I could now distinguish the membrana tympani perfectly; it was of a dull white colour, evidently much thickened, but not perforated in any part.

September 3rd. He has continued to improve in every respect; his health and spirits are quite restored; all discharge from the ear has ceased; the tinnitus aurium now consists in a slight "booing" which appears occasionally: the hearing is slowly returning. The snuffling and loss of smell I now found to be caused in a great measure by a small gelatinous polypus which filled up the cavity of the right anterior nares, which upon being removed greatly assisted to restore both the nasal respiration and the sense of smell.

This case is instructive, as shewing the rheumatic character of some of the inflammations of the ear, and as exhibiting the occasional failure of the mercurial treatment to cut short the disease, particularly if it has advanced to any height, as this had. The discharge came from the external ear and the polypus. This morbid polypoid growth, thus appearing during the progress of an inflammation, should always lead the practitioner to suspect mischief going on in the neighbourhood, and should cause him to examine with great care the condition of the mastoid process and its coverings, although neither the existence of a polypus, nor the fœtor or dark colour of the dis-

charge, are of themselves a sufficient proof of caries or denuded bone. The appearance of periostitis, even at this late period, is not an unusual consequence of violent otitis; the inflammation may spread from the periosteum lining the bony portion of the meatus; or the mastoid cells may, and often are, the seat of inflammation, and this inflammation may extend from the layer of bone which covers them to the periosteum. If not relieved by such local and general means as were made use of in the early part of the foregoing case, the surgeon should not hesitate to cut down upon the covering of the bone, and divide it fairly for an inch or more of its length. Almost immediate ease follows this operation, even though we fail to discover the existence of pus; and, moreover, delay after a certain period may prove fatal. A thin shell of bone is occasionally thrown off in such cases, but not always. Generally speaking, the otorrhœa lessens when the discharge from the wound is fully established, although there may not be any communication whatever between the parts from which these discharges come. I had occasion to resort to this operation five times during the past year: in two cases it was followed by the exfoliation of a thin shell of bone; in all, hearing was restored either partially or completely. Performed in the situation and in the manner described in the foregoing case, the hæmorrhage which follows is generally very trifling. It is necessary to keep a tent in the wound till suppuration is established. When this pain over the mastoid process appears early in the disease, and is accompanied by an erysipelatous redness and œdema of the scalp, we should not hesitate in having recourse to incision immediately.

We have in this case another remarkable example of a mechanical impediment, such as the polypus, so completely obstructing sound that a watch held to the ear was not perceived, although hearing returned within a few hours when that mechanical obstruction was removed. There can be little doubt of the middle ear having been engaged in this inflam-

mation, yet we have no evidence of perforation of the membrane of the drum having taken place. The only treatment at present employed with Mr. F. is that of occasionally washing over the auditory canal and membrana tympani with the ten-grain solution of nitrate of silver(*a*).

September 10th.—His hearing had increased to the distance of ten inches on the affected side. It continues to improve.

II. SUBACUTE INFLAMMATION OF THE TYMPANUM AND ITS MEMBRANES.

Besides the acute form of the disease, attended by violent pain, &c., which I have already described, there is a description of subacute inflammation of the membrana tympani, with which I have been long familiar, and which, although perfectly painless, is equally destructive to hearing. It generally appears in persons between 15 and 30. The first symptom to which the patient's attention is directed is deaf-

(*a*) It was with considerable surprise I read an article by Dr. Bonnafont in the *Gazette des Hôpitaux*, for November last, recommending a *powder of nitrate of silver to be blown into the ear*, for the cure of ulcerations attending otorrhœa. With still greater wonder and regret have I seen such a practice quoted and recommended in British journals. A more empirical practice, except that of a farrier blowing powdered white sugar and quicklime into the eye of a horse, to cure it of the "Haws," I never knew advocated. With as much reason should powdered caustics be blown up the vagina, or the rectum, or into the throat or nose, or into the eye, to cure a spot of ulceration on these parts, as into the ear; and with as much ease, certainty, and security can an ulcer in the auditory passage, or on the membrana tympani, be touched with a caustic, either in substance or solution, without injuring the adjoining surfaces, as into any of these cavities. See the London and Edinburgh Monthly Journal; Ranking's Half Yearly Abstract for July, 1847; and Mr. Ancell's Report on the Progress of Aural Surgery.

So long as practices, such as that recommended by Dr. Bonnafont, are quoted by our English journals, so long shall the treatment of diseases of the ear be considered an "opprobrium" to medicine.

In the present state of aural surgery the record of well-observed cases would greatly assist the progress of this department of medical science.

ness, which has appeared rather suddenly. It may be, but is not always, accompanied by tinnitus. The nature of the disease is only to be learned by a careful inspection of the membrane, which, if we see the disease early, is always of a pink colour, of a tint somewhat paler than that of the monthly rose. Through this, dispersed in various directions, we observe in some cases a few long, tortuous vessels. The transparency and polish of the membrane are seldom much affected at first. The auditory canal does not usually exhibit signs of disease, but the ceruminous secretion is arrested. Generally speaking, there are no constitutional symptoms present, and when tinnitus is an accompaniment, it is usually of a very light character, resembling a slight buzzing or singing. If allowed to proceed unchecked, the membrane becomes thickened and remarkably opaque, from lymphy deposits, and the deafness which ensues is of a most irremedial nature. Collapse or drawing inwards of the tympanal membrane does not usually follow this form of the affection, but ulceration, even to perforation of the membrane of the drum, is not an uncommon attendant upon it.

This disease is slow in its progress, and requires very careful watching. Cases of this nature have been, I feel convinced, repeatedly treated as "nervous deafness." I am inclined to think that it is a true myringitis, in which the inflammation is seated in the fibrous layer of the membrane. In this disease mercury is just as necessary as in that already detailed; it should, however, be given after a different fashion: to be effectual, it must be slowly introduced into the system, so as to produce a steady and gradual effect. The mouth should be kept sore until there is a decided improvement both in the vascularity and in the hearing, or until all hope of restoration has been abandoned, or other circumstances induce us to relinquish this mode of treatment. After the constitution has been fully affected by the mineral, the bichloride, given in doses from the

sixteenth to the eighth of a grain, dissolved in proof spirits, and taken in half an ounce of the cold infusion of bark, and a scruple or half a drachm of Huxham's tincture, three times a day, will be found highly efficacious. The preparations of iodine are also, in the advanced stage of the disease, worthy of trial; but I do not think that the preparations and combinations of iron produce in aural inflammations the same benefit which they do in constitutions labouring under ophthalmic affections of a like character.

Counter-irritation by means of tartar emetic ointment(*a*), or the continued application of Albespeyre's paper, keeping up a discharge from the integuments over the mastoid process, will hasten the cure. Should the constitution require it, change of air, removal to the sea, and generous living, &c., must be had recourse to.

To relieve tinnitus aurium, after the inflammatory action has been subdued, or the original disease which produced it has subsided, and particularly in cases where we find this symptom present without any apparent lesion of the parts which we are able to inspect, I have latterly found the preparations of the *Arnica montana* of decided benefit; indeed it is the only medicine with which I am acquainted that seems to possess a specific power over this annoying and usually most intractable complaint. The preparation I find most efficacious is the tincture both of the flowers and leaves, of which the patient should commence by taking fifteen drops in a table-spoonful of the infusion of Arnica, and a little of some cordial tincture three times a day. After a few days the dose should be in-

(*a*) Great care should be taken in applying this ointment behind the ears, as it is very apt to produce large unhealthy-looking pustules, not unlike the disease we know as "burned holes" (*pemphigus gangrenosus*), particularly if allowed to spread over the back of the auricle. To make it act more speedily it may be mixed with a little powdered white sugar, and spread upon a piece of lint, which, after the part has been rubbed with the ointment, is to be applied in the form of a plaster, and retained till the pustules are produced.

creased one or two drops daily, till it reaches thirty, or even more, unless headach or giddiness be produced, when we should at once lessen the dose, or omit the medicine altogether for a short time (*a*). The state of the bowels should be carefully attended to during the administration of this drug.

So long as any vascularity or recent deposit exists in the membrana tympani, notwithstanding manifest improvement of the hearing, we should not desist from employing means to remove it, as these cases are of a most insidious and protracted character. When ulceration exists, we should touch the part daily with a solution of lunar caustic, applied with a fine brush. The same mode of treatment is applicable to perforation of the membrane, and I have latterly been astonished at the number of cases in which, under this treatment, or touching the edge of the perforation with a fine point of the solid nitrate of silver, applied upon a *porte-caustique*, together with proper constitutional treatment, these apertures have healed up. After an extensive trial of various other escharotics, such as the nitrate of mercury, and the sulphate and nitrate of copper, I find the preparations of silver the best.

In all the inflammations of the middle and external ear, the secretion of cerumen is arrested, and it is long after the disease has been relieved, that the ceruminous glands resume their healthy functions, the auditory passage remaining dry and its lining scaly: or the wax which is produced being insufficient in quantity, of a very dark colour, and soon becoming

(*a*) The following is the formula for the tincture prepared for me by Messrs. Bewley and Evans. One ounce and a half of the *flowers* to a pint of rectified spirit of wine; macerate for fourteen days and strain; or, for the tincture of the *leaves*, the same quantity infused for a similar period in proof spirits. In prescribing these I usually order them in equal proportions.

Dr. Neligan says: "This tincture may be readily prepared by percolation, having previously macerated the flowers with a little of the spirit for twenty-four hours; or it may be prepared with the cut and bruised root in the proportion of ℥ii. of the root to Oj. of rectified spirit. Dose, f. ℥ ss. to f. ℥ii."—*Medicines and their Uses.* Second Edition.

hard and inspissated, &c. This deficiency of cerumen, which is but a symptom, is often set down as a disease, and various applications of ox-gall, creasote, &c., have been recommended to restore it. I find, however, that nothing produces a healthy action in the parts so soon, while, at the same time, it immediately supplies the best artificial succedaneum, as the *unguentum citrinum fuscum*, the soft brown citrine ointment, applied to the auditory passage in a melted state with a soft brush(*a*).

Case IV.—*Subacute Tympanitis with Paralysis of the Portio Dura.*

Patrick Rooney, aged 35, suffered from typhus fever about fourteen years ago, during which he had violent pain in his left ear, accompanied by a discharge which has continued ever since. He is quite deaf upon this side, and upon examination

(*a*) There is no other medicine in the whole materia medica so frequently prescribed by the practitioner, which presents the same differences, both in appearance and effects, as citrine ointment. According to the ordinary method of preparing it, as directed in any of the Pharmacopœias of the three kingdoms, it is impossible to procure it alike in any four different establishments. It is found of all shades of colour,—straw-coloured, grey, green, yellow, orange,—and of every degree of consistence, dry and hard, or soft and pasty. Many apothecaries in Dublin do not adhere to the pharmacopœial formula, but make it up according to a form of their own; some use fresh butter instead of lard and oil, and others different kinds of oil, as from habit or experience they find best. Some of these, however, are liable to the objections already stated. Moreover, if mixed with almond oil, as in diluting it into an eye-salve, although it looks yellow for a day or two, it soon becomes green, and gets a very unpleasant smell, no matter whether covered up or not, and in this state it is often very irritating. On explaining my difficulties, some two or three years ago, to Mr. Donovan, he procured me a citrine ointment of a very dark orange or brown colour, soft, perfectly and equally smooth, and which does not alter in any way by keeping, by exposure to light, by mixing with oils, or even by being gently heated to the point of fluidity: and it never acquires an acid smell. Its therapeutic effects I have had long experience of, and they are decidedly superior to those of the ointment in common use;—Mr. Donovan has not made known

the membrana tympani is found to be perforated at its anterior portion, and the whole membrane, auditory passage, and middle ear as far as can be seen through the aperture, are of a bright florid red; the ossicula, however, remain *in situ*. The hearing in his right ear remained perfect until the beginning of May last, when he began to perceive a deafness upon that side, which after a few days was accompanied by a most distressing noise resembling "the escape of steam;" he had also a rolling noise in his head, but no pain in either head or ear. He applied for medical advice, and had "drops" of an irritating nature poured into the meatus. Not having derived benefit from these, he applied at St. Mark's Hospital on the 29th of May, 1847. The noise and deafness were as already described; in addition he suffered from headach and pain in his face.

The right side of the face was then completely paralyzed, presenting the usual appearance of fulness and smoothness; the mouth drawn to the left side, the eye staring from inability to close the lids, the tears flowing over upon the cheek, the nostril collapsed, the colour of the skin somewhat heightened, and its temperature considerably raised beyond that of the opposite side. The auditory canal was dry and red; the tympanal membrane had completely lost its polish, and presented an

its constituents, nor its mode of preparation. Mr. Nicholls has made for me a citrine ointment precisely similar in colour, smell, consistence, and effects. He informs me that he has used rape oil instead of olive oil, and has never let the heat employed during the preparation exceed 200°. Mr. John Evans has employed cod-liver oil, and also seal oil, and the preparations thus produced are exceedingly elegant and useful ones. Messrs. Bewley have obtained for me a brown citrine ointment somewhat like those already mentioned, and they inform me that it is by using only the very purest olive oil. I find this ointment a decided improvement on the old preparation, and its composition should be investigated by those engaged in the preparation of medicines and pharmacopœias. When about to be used, it should be melted to the consistence of cream by placing the vessel containing it in hot water. It forms an admirable application in ophthalmia tarsi.

uniform pink appearance, not unlike blotting-paper. He had no pain anywhere around or about the ear, nor could pain or soreness be produced upon making pressure in any of the usual situations. He was able to inflate the tympanum; but could not hear the watch placed to the ear or any part of the head, and could with great difficulty distinguish the voice.

He was slightly mercurialized by the use of the hydrargyrum cum cretâ with cicuta; leeches were applied several times round the meatus, and small blisters over the mastoid process. As soon as his mouth became sore (in about ten days), the hearing returned, so that he could hear ordinary conversation very well; the vascularity of the membrane lessened considerably, and the noise decreased. On the 15th of June the paralysis had quite disappeared; he was then obliged to discontinue his attendance at the hospital, but was given some of the iodine and hydriodate of potash solution to take occasionally. Wishing to learn the result of this case, I sent for the patient, and again examined him upon the 10th of September last(*a*). He had no return of the paralysis; the hearing remained much the same; the meatus still red; the membrana tympani, over the head and handle of the malleus, was bright red; the rest of the membrane, with the exception of one clear spot in front of the point of the malleus, presented a dull, pearly hue; there were no folds observable in it, but a very opaque rim, like a broad arcus senilis, round its lower attachment.

The paralysis in this case seemed to have been caused by the inflammation in the ear extending to the portio dura. Now may not many of those cases of facial paralysis, so frequently met with, and some of which are apparently the result of cold, have been produced by a like affection? The state of the drum in all such cases should be accurately investigated.

(*a*) I would strongly recommend those engaged in hospital or dispensary practice in a large city, to make a note of the address of any patient whose case is interesting, in order that they may be able to learn the final result of such.

Case V.— *Sub-acute Myringitis; Mercurial Treatment; Recovery.*

The following case affords a good example of the subacute form of the disease, of the inattention paid to the early symptoms of deafness by practitioners in general, and the efficacy of anti-phlogistic treatment. As the subject of this case, Mr. S., aged 19, is a young gentleman of very great intelligence, I give the history of his case, as far as possible, in the words of the narrative with which he has furnished me. "About the year 1836 I felt symptoms of deafness in both my ears for the first time, but on the application of blisters these symptoms passed away. From being but a child at the time, I have an imperfect recollection of the peculiar symptoms of my case. Again, in 1840, I became quite deaf in my right ear: this I mentioned to our family physician, but for some time he treated it as a joke, telling me merely that I was idle and wished for some holidays; however, on my frequently asserting that I really *was* deaf, he directed me to syringe my ear night and morning, and afterwards he dropped some liquid into it which he prescribed for me, but he did not make any particular examination of my ear. I continued to follow his advice for some weeks, but without any beneficial effect. I was then advised to get some rusty bacon, cut it into small shreds, and put one, morning and evening into my ear,—but with no better success(*a*). At last I applied a blister behind my ear, and kept it open for six months. This treatment, which may, and very probably would, as experience has since shewn me, have been successful, had it been resorted to in the first instance, was then of no avail. On two subsequent occasions, about Christmas, 1841, and July, 1842, I had an ear-ache in that ear, and the only application

(*a*) This is a very popular remedy in Ireland, and is frequently prescribed by medical practitioners. In cases of deafness, unaccompanied by inflammation, and solely the result of a deficiency of cerumen (very rare cases, by the way) it is innoxious, and may be effectual, but in no other case that I am aware of is it at all applicable.

which gave me relief was dropping warm laudanum into it(*a*). At the close of September, 1845, I felt my left ear one morning as if it were stopped, and perceived a buzzing sound in it, such as one feels on applying a sea-shell to it. This noise was increased at night when I lay in bed; it then resembled a constant, loud hissing. I became very deaf, and my difficulty of hearing increased daily; I also experieneed an uneasy sensation, and a feeling of stuffing, in this ear, but no pain."

On the 21st of the November following I first saw this young gentleman. I found, in addition to the symptoms already described, a bright pink hue diffused over the left tympanal membrane, which, however, had not lost its polish, nor beeome opaque. He was with difficulty able to inflate the drum, and when he did so, the stream of air caused a slight squeeling and a mueous gurgling in the middle ear. The external meatus was dry, devoid of cerumen, and somewhat redder than natural. The throat, however, was normal. It was evidently a case of subacute inflammation of the membrana tympani, of the mucous membrane lining the eavity of the drum, and the Eustachian tube: with mueous engorgement of the middle ear. Upon the right side the membrana tympani was found thiekened and opaque, and two or three large, red vessels spread over its surface, but on this side the air passed up with faeility. Six leeches were immediately applied to the left ear, three round the meatus and three in front of the tragus, and warm stupes and fomentations preseribed. Upon the 29th his symptoms remained unabated and the appearanees unaltered, so I immediately put him on the use of mereury, at the same time that a repetition of the leeches round the meatus,

(*a*) Laudanum dropped into the ear is one of the most popular remedies for ear-ache, and in many instanees it certainly affords relief. We do not objeet to its applieation as a means of lessening pain, but we do as a remedial agent, while the *cause* of the pain is uninvestigated, and not treated aecording to the established rules for lessening inflammation, &c.

and the application of blisters over the mastoid process, was had recourse to. As soon as the mouth became slightly affected I observed that the vascularity of the right ear,—the one originally affected,—was very much lessened, and I then recommended the application of leeches and blisters to that also, and had the satisfaction to find that the hearing began to improve gradually on this as well as the left side.

As Mr. S. improved daily the mercury was omitted, and he commenced the use of bark and hydriodate of potash. Towards the end of December he was so much improved that I discontinued my attendance, and I lost sight of him for a short time. In the beginning of January, however, he again applied to me: worse than ever. The weather had been remarkably damp and unfavourable; he was much exposed to its influence, and had caught cold, which, to use his own expression, had "pitched in his ears." He was then so deaf that he could with great difficulty understand what was said to him, although addressed in a distinct and loud voice. The vascularity had returned in the left, and partially in the right ear, and the mucous engorgement of the tympanal cavities was more manifest. The same course had to be pursued as on the former occasion; he was confined to the house for a month, and kept under the gentle influence of mercury for the last three weeks of that time. I desired him to try occasionally to press the air into the drums, particularly when blowing the nose; and as the inflammatory condition subsided he was enabled to do this with greater facility. Each time the air passed his hearing was improved. At the end of a month the mercury was discontinued and the leeching given up. Small blisters were kept open behind the ears, and the use of bark and hydriodate of potash was persisted in for some weeks longer. I examined this gentleman in November last, and found that all trace of disease had been removed from the left ear, and that the tympanal membrane of the right was much thinner, and much less vascular and opaque, than when I

first saw him in 1845. His hearing is perfect upon the left side, and very much improved on the right, the hearing distance being increased on that side from three to fourteen inches.

In the foregoing case we have a good example in the right ear (which, when I first saw it, was in the condition of chronic inflammation, to be described in the next section) of the effects of neglect, and also of the efficacy of the antiphlogistic treatment, not only in the removal of recent disease, but in the improvement of an affection of several years' standing.

I could enumerate several other well-marked cases of this disease, were it necessary, all presenting the same appearances, and cured by the same means, but in very few has treatment been attended with the same happy results in the ear previously affected as in this case. Generally only one ear is affected at a time, but sooner or later the other usually becomes engaged. I feel convinced that many cases of incurable deafness have arisen from this disease.

III. CHRONIC MYRINGITIS, WITH OR WITHOUT INFLAMMATION OF THE TYMPANUM.

By referring to the table of aural diseases published in the former part of this Essay (vol. iv. page 392), it will be seen that this is a very frequent cause of deafness, eighty-two cases having been recorded out of 709, or nearly one in nine of the whole. Indeed, I am inclined to think that it is even of more frequent occurrence; as although many cases present themselves as such in the beginning of the deafness, the appearances of chronic inflammation of the drum are to be found as the sequelæ of nearly all the other forms of inflammation, in the same way that we find chronic ophthalmia so frequent a consequence of the various acute forms of inflammation of the eye. This disease presents under two forms; the first, a perfectly painless deafness; the other attended by paroxysms of violent pain, coming on at intervals, between which the patient is perfectly free from all uneasiness. The latter is much more

common among females from 15 to 30, and is at times accompanied by irregularities of the uterine functions. The appearance of the membrana tympani is too peculiar to be mistaken. It presents a general thickening and opacity, particularly of its lower portion, besides which there is almost invariably a number of spots, about the size of pin-heads, of greater density than the rest, and of a pearly lustre, studded over the surface of the membrane. In many cases it presents the appearance of crumpled parchment. During the quiescent periods, we only remark a few straggling vessels, carrying red blood, spreading over the surface of the membrane, and, for the most part, coursing from above downwards, parallel with the handle of the hammer. Upon any provocation, however, such as cold, or other exciting causes, the membrane will, in a few hours, and often without any increase of pain, become of an uniform dark red colour, precisely like *pannus* of the cornea, a disease of which it is the manifest analogue. The greater the amount of thickening and opacity, the less will be the quantity of vascularity and redness which the membrane is capable of assuming, as we perceive in cases of dense opacity of the cornea, owing, no doubt, to the greater quantity of deposit obstructing the flow of red blood, by diminishing, and, perhaps, also obliterating the caliber of the vessels.

Cases of this kind are often of many years' standing, and many have, I am convinced, been treated as instances of "nervous deafness." The following is no imaginary case, but one of constant occurrence.

A lady, aged between 30 and 40, consults a practitioner in aural surgery. She is very deaf, speaks in a loud, inharmonious voice, and has suffered from noise in her ears, of all descriptions, for several years. She usually prefaces the detail of her symptoms (which is generally very long and verbose) by stating that she does not think much can be done for her, for that she is labouring under *nervous deafness*, and is, therefore, incurable. She has a great objection either to be questioned

or to have her ears examined until she has made a full statement of her case; and as she has had a great variety of opinions, and has used all manner of remedies, she is tediously accurate in her account. She states that she has been deaf from a very early period; that at first her deafness was attributed to inattention, and endeavoured to be remedied by the means thought most advisable by her guardians and governesses; that, her deafness increasing, she was brought, when about ten or twelve years of age, to an eminent practitioner, who, after a few casual inquiries, told her friends not to mind it, for that she would certainly grow out of it as she grew up, and that probably all her deafness would disappear about the period of puberty; but that she might rub *eau de Cologne* on the jaw occasionally! With the exception of sea-bathing, and means calculated to improve the state of her general health, no other remedies were tried, and no other advice sought for two or three years; when, not finding the hearing improved, but gradually becoming worse, and the tinnitus increasing as she grew up, a special aurist was consulted, who stated the disease to be entirely local, and curable by local remedies alone. During the next few years various means were had recourse to; catheterism of the Eustachian tube was employed for several months, the tympanum constantly washed out, and various liquids and gases injected into it, but without effect. Counter-irritation was next employed, with issues in the arm and setons in the neck, and a long and fair trial given to their powers. It was next proposed to remove the tonsils,—and in several such cases they *have been* removed, or, at least, portions of them. Still the disease progressed. Drops, oils, and liniments, some of the most caustic nature, were without mercy, and without discrimination, poured into the external meatus, by those who

> "Stole
> With juice of cursed hebenon in a vial,
> And in the porches of *her* ears did pour
> The leperous distilment."

Broken down in health, wearied by the variety of opinions and the multiplicity of applications, an eminent physician was then consulted, who, having heard the history of the case, advised the cessation of all local remedies, and recommended tonics and antispasmodics, together with shower-baths, change of air, and sea-bathing: stating at the same time that the disease was entirely constitutional, and of a *nervous* character. And certainly by this time, from hope deferred (for many specious promises of cure had been made), from the increase of the tinnitus, and from the effects of the long and severe treatment, the patient had become remarkably nervous and irritable, brooding over her malady, and rendered unhappy and discontented by being unable to take part in any general conversation.

Some years now passed without her doing anything; she had not become much worse, but she certainly had not improved. Owing to some new theory being started, at the solicitation of friends who had been relieved of some curable form of deafness, or from the celebrity of some particular practitioner, she was again induced to seek relief; and having arrived at the metropolis, she took the round of the doctors and aurists. Some proposed perforation of the drum, others recommended travel; the honest prescribed nothing; the quack proffered his panacea, or offered to sell his peculiar acoustic instrument, and backed the recommendation of its merits by the sign manual of some of the judges of the land(*a*). The homœopathists and hydropathists were each consulted, and the merits of their systems tested; the spas of England and the Badens of Germany were visited, and their efficacies tried. Electricity, galvanism, and electro-magnetism, were also had recourse to, but in vain. The opinions of those whom she had consulted were as various as the remedies they employed: but the greater

(*a*) In a window in the Strand, not far from Somerset House, may be seen, framed and glazed, a certificate from one of the Chief Justices of England, lauding, and recommending to all whom it may concern, a particular form of ear trumpet!

number believed it to be a constitutional or nervous affection. Latterly she had been content to look out for "cures" among the newspaper advertisements, and of these she possessed a large number in her portfolio.

Of such cases, scarcely differing in a shade, I possess the notes of several. In many of these the following may be gleaned upon a careful examination. The membrana tympani will be found thickened, opaque, and slightly vascular, and sometimes very much collapsed or drawn inward towards the inner wall of the tympanum, so that the handle of the hammer forms a manifest projection. The membrane has also lost its polish and become of a dull pearl colour. On questioning the patient closely, it is acknowledged that constant attacks of *ear-ache* were suffered several years previously, particularly in winter, and that such attacks were often preceded or accompanied by stuffing in the nose, and symptoms of catarrh, and were generally induced by cold, to avoid which the head was usually kept warmly muffled during such seasons.

In such a case our art at present does not offer much hope. The whole train of symptoms are evidently the result of slow chronic inflammation, affecting, in all probability, the lining of the cavity, as well as the membrane of the drum. The only means which can with safety be recommended at this period is the application of a solution of lunar caustic, applied with a camel's hair brush, every third or fourth day, upon the surface of the opaque membrane, while it is fully exposed to view, and should there be much vascularity present, the application of a few leeches as far in as possible round the meatus, at least twice a week. In a few cases the Arnica will assist to remove the tinnitus; but it is not so efficacious in this as in more recent forms of the affection.

In the cases of periodic pain, with a higher degree and more generally diffused vascularity, the application of leeches, applied every second or third day, will be found most effica-

cious; at the same time that the patient should be brought under the gentle influence of mercury, and kept so for at least a month. Under such treatment, if the case is not of too long standing, the hearing will often be restored, and all the symptoms of pain and tinnitus may be removed. As the symptoms improve, the membrane will clear generally, but in most cases spots of opacity remain indelible. In applying the solution of nitrate of silver with a fine brush, considerable caution and dexterity is required, as the membrane will sometimes present a small perforation the next day if it has been rubbed too hard; and although I have always seen such perforations heal readily, it is an accident which should be avoided. By this application scales of membrane peel off the surface of the part, and leave it thinner and more transparent than before.

There is a form of deafness with which I have been long familiar, which may be the result of some form of inflammation in the membrane of the drum. In such cases, upon bringing the external membrane into view, we do not observe any general thickening or opacity of it, or any apparent alteration of its texture, but a crescent-shaped opacity, about a line broad and three lines long, of a yellow colour, occupies the lower and usually the back portion of the membrane, with a tolerably defined edge, and rather rough upon its surface, closely resembling the atheromatous deposits which occur in the coats of arteries. It is quite gritty, and generally more insensible than the rest of the membrane. It differs from the ordinary opacity, the effect of inflammation, in the surrounding membrane being apparently free from disease, in its almost invariable seat, its yellowish colour and well defined edge, and in its having a portion of unaffected membrane between it and the bony attachment of the membrana tympani; whereas, as I have already remarked, the opacity which results from the ordinary form of inflammation, generally increases in density around its osseo-cartilaginous attachment. By a very slow and gradual process

this disease spreads over the greater portion of the membrane, and produces permanent deafness. I am not aware of any remedy for it.

In some instances I have observed a manifest granular state of the membrane, not unlike the surface of a half ripe raspberry, the intervening portions between the reddish elevations being thickened and opaque, but unattended by discharge. In these cases I have procured an uniform thinning and clearing of the membrane, by the occasional application of a fine point of nitrate of silver; but this requires very great care, and should be persevered in for a great length of time, at least two months; it should, if possible, be applied so lightly as not to induce a discharge. Many of those cases are the result of long continued otorrhœa, but which, having healed, has left the membrane in this condition. It must be borne in mind that I am not now describing that form of chronic inflammation which is the ordinary attendant on otorrhœa, and which is the affection to which writers have given the name of "chronic inflammation of the membrana tympani." This disease, which I have been describing, may be the result of any form of inflammation, specific or otherwise.

In cases of permanent thickening and opacity of the membrana tympani, which have resisted all efforts at absorption and thinning, are we justified in performing perforation? I believe in very few cases indeed will it be found efficacious, because the opacity which we *do* see is but a portion of the general thickening and disorganization of the investing membrane of the middle ear, perhaps that of the labyrinth also, which we do *not* see. It may, however, be tried without injury in some cases, but it requires very great caution and dexterity indeed in its performance; and, as irreparable mischief has at times proceeded from its being done in a rough or clumsy manner, I beg to offer a few observations on the safest method of performing the operation of perforation. I wholly discard all the instruments in the shape of punches, trocars, and complicated

apparatuses for the removal of a portion of the membrane, of which several are described as those of Fabrizi, Himly, and others, and figured in works on aural surgery. First, because they all occupy so much space within the speculum that it is not possible, when they are introduced, to see accurately the point of the membrane which they are pressing upon, nor how much of it they are cutting; secondly, by our not seeing accurately the surface on which we are working, it is scarcely possible to avoid injuring the malleus or the chorda tympani, or wounding the inner wall of the tympanum; and, thirdly, because those with corkscrew points, which fix the membrane while the revolving punch cuts out the piece, are not only exceedingly painful, but dangerous, inasmuch as the slightest motion of the head during the operation would produce a degree of violence which might be at once destructive to this delicate membrane.

Having brought the membrane fairly within view, under bright, direct sun-light, I introduce this small, sickle-shaped

knife, with a double-cutting edge, and here figured of the natural size in the blade, but with the shaft and handle about two inches longer; and having made the patient inflate the tympanum, so as to make the membrane tense, and pressed outward, I gently introduce the point of the knife into its lower, thin, vibrating portion, and, drawing it downwards and forwards, make a simple incision of the membrane, about a line and a half in length. So simple is this, and so little pain does it give, that the patient has often been unconscious of its performance until made aware of its completion by the air rushing out through the aperture. In about a minute a slight oozing of blood takes place from the edges of the aperture, like that which follows a wound of the sclerotic with an ordinary broad cataract needle, and if left in this condition it would soon heal up; therefore, a very fine probe, fixed in a handle, and slightly pointed with nitrate of silver by being immersed in the caustic when heated to fluidity, should be immediately passed down into the perfo-

ration, the edges of which are thereby cauterized and prevented adhering; and this latter process should be repeated from time to time, as often as the wound shews an inclination to heal, and until we establish a sufficiently large elliptical opening(*a*).

IV. STRUMOUS INFLAMMATION.

This is a frequent affection in young persons, and, I believe, a very constant cause of deafness in after life. Its subjects are always from three or four years of age to 15 or 16. It

(*a*) In the month of March, 1846, Dr. Butcher, of this city, read a paper before the Surgical Society of Ireland, on the subject of Perforation of the Membrana Tympani, with a view of shewing the ill consequences resulting from the performance of that operation. He related the cases of two young persons, a man and a woman, in both of whom it would appear that death ensued from puncturing the membrana tympani. Where fatal consequences are said to result from an operation which heretofore has proved, to say the least of it, innoxious, it is of very great importance that we should inquire into all the circumstances attending these cases, and the mode of performing the operation. The first instance was that of a young woman, deaf in both ears for four years, the only history of whose case is, that prior to this period she got a severe cold, with a swelling of the glands of the neck; but what was the cause of her deafness, how it arose, what was the condition of the membrane tympani, why the operation was performed, in what manner, by whom, or with what instrument, we are not informed; all we know is (I quote from Ranking's Abstract), that "catheterism of the Eustachian tube was performed and said to fail; hence it was agreed upon that the membrane of the tympanum should be pierced, a small piece being drilled out of the membrane of the right side;" but we are not told any other circumstances attending the operation, nor who witnessed it. Pain and other evidences of inflammation in the ear ensued, and profuse discharge took place, but what the condition of the ear was we know not. At the end of four months she died, with symptoms of diseased brain; and upon examination it was found that the dura mater covering the petrous portion of the temporal bone was roughened and softened in its texture, particularly near the internal auditory foramen. The membrana tympani was *entirely destroyed* and the lining membrane of the tympanum thickened and villous. Now, while we are totally in the dark as to what the condition of this case was originally, it is manifest that some great violence must have been done to the drum of the ear in the performance of the operation.

The second case is equally defective as to the cause of deafness or the

chiefly attacks the light-haired, fair-skined, blue-eyed, and those who exhibit well marked evidences of a scrofulous constitution. Its first symptom is that of deafness, generally attributed to inattention: scarcely a fortnight passes that I do not see a boy or a girl, from ten to fifteen years of age, from some of the public schools, who, having been deaf for the two or three months previous, had been constantly reprimanded for inattention.

Upon examination, however, the tympanal membrane will be found of an uniform pinkish hue, but without either thickening or opacity, at least in the early stages; the auditory passage is dry, but seldom red. There is generally mucous engorgement of the cavity of the tympanum, with thickening and increased redness of the faucial mucous membrane,—a condition which, there can be little doubt, extends through the lining of the Eustachian tube into the middle ear. Enlargement of the tonsils is a very frequent accompaniment; and glandular swellings about the neck not an uncommon appearance in such cases. It is, generally speaking, a painless disease,

appearance of the ear, although the *post mortem* examination was most interesting; all my friend, Dr. Butcher, states, is, that the man was deaf for twelve months previously, and that he then applied to a surgeon, and had his tympanum pierced, but why, or whether with a gimlet or a punch, a trochar or a probe, we are not informed. At first the hearing was improved, but then relapsed; after some time head symptoms set in, and the man died in the course of six weeks. Upon dissection, evident traces of inflammation of the brain and its membranes were discovered; the dura mater in particular, covering the auditory portion of the temporal bone, was rough and thickened, and a small abscess was discovered in the anterior globe of the brain, upon the same side on which the perforation was said to be performed. In this case, however, the original cause of the deafness, namely, a small tumour about the size of a bean, lying on the auditory portion of the seventh pair of nerves, was discovered. This was evidently a case in which the operation never should have been resorted to. Dr. Butcher deserves much credit for making those cases public, but it is much to be regretted that the statement of the surgeon who performed the operation was not obtained, nor the appearances of the ear, both before and after the operation, described.

and but seldom accompanied by tinnitus in the first instance; occasional crackling sensations, gurglings, and sometimes loud reports, are felt in the ear by patients themselves. Catarrh, stuffing in the nose, and great liability to cold in the head, are not unusual symptoms, or rather are attendants; there is no pain on pressure in or about the ear, the throat, the mouth, or the Eustachian tube. Strumous affections of the eyes are not an unfrequent complication, and these, particularly corneitis, which it very much resembles, and also strumous ophthalmia, sometimes alternate with the affections of the ear. The amount of deafness varies from a hearing distance of eight or ten inches with a watch, to total inability to hear a watch applied to any part of the head, or held between the teeth, or even to hear what is said in a loud and distinct voice; and, generally speaking, the amount of redness and vascularity presented in the membrane of the drum is in the ratio of the amount of deafness; but the latter is very variable, and would in many instances appear to be influenced by the state of the atmosphere, being greatest in damp, moist weather. In some cases the redness assumes a dark, damask rose colour, and then we may generally rest satisfied that the entire of the middle ear is engaged. Simple mucous discharge occurs occasionally, and otorrhœa succeeds in the more aggravated cases, as the disease advances, but it need not present at any period of the affection. The constitution is generally below the standard of health; the patient is usually pale, languid, and inactive, with, perhaps, slight loss of appetite, and some dryness of the skin.

The treatment in this disease should be chiefly directed to improve the condition of the constitution, and I know nothing better for effecting this object than the use of bark in its various preparations, conjoined with iodide or bromide of potassium, and, when the inflammation is of a more active character, the chloride of mercury. In the advanced stages, and where there is much constitutional taint evident, with enlargement of the cervical glands, &c., the oleum jecoris will be found most ef-

fœtual; but whichever of these are employed, it should be persisted in for a considerable length of time. This is a slow and tedious disease, lasting, even in the most favourable cases, for months, and is liable to relapse, and return again and again. Such patients should, therefore, be carefully watched, and their ears examined at least once a week, while any trace of inflammation remains. A dry, pure, country air will always be found beneficial, and perhaps I should add, a residence by the sea-shore in summer; but, as far as my experience extends, I have always found bathing in the open sea injurious. The warm bath occasionally, appears to be of use. As in cases of strumous ophthalmia, so in scrofulous myringitis, a leech or two may be required occasionally, although depletion is not generally indicated.

As the tongue is usually white and clammy, and the dejections often vitiated, small doses of chalk and mercury, combined with rhubarb and columba, given as alteratives every second or third night, will assist our other means. The diet should be light and highly nutritious, while all acid fruits, pickles, and ill-boiled or stale vegetables should be avoided. Constant open air exercise during the fine part of the day is very necessary; and when the weather is at all harsh, cold, or damp, a light covering should be worn over the ears, or small bits of cotton laid in the concha; but in the house, or in warm weather, these precautions are unnecessary; neither do I believe it at all efficacious to keep the head warmer than under ordinary circumstances.

Locally, counter-irritation will be found most effectual, and I find the vesicating liniments more efficacious in producing the desired effect than the ordinary blistering. As such, the strong tincture of iodine, with acetum lyttæ, or croton oil and acetic acid conjoined with spirit of turpentine, oil of rosemary, and soap liniment, form very useful applications. The liniment should be rubbed over the mastoid process, and lower down, as far as the angle of the jaw, once or twice a day, until

a slight vesicular rash is produced, when its use should be discontinued until the redness has disappeared, and then it should be reapplied as before. This counter-irritation should be kept up for a couple of months at least, varying the application as the parts become accustomed to any particular substance. Whatever substance is used, great care should be taken that it does not spread over the back of the auricle, which is very likely to become inflamed and greatly swollen by it; to prevent this a small fold of linen should be applied between the auricle and the mastoid process after each application. Should pain be experienced on pressing the tragus backwards with the finger, a single leech should be applied either on that spot or within the circle of the meatus, but, generally speaking, local depletion, as I have already stated, is less indicated in this than in any of the other inflammations of the drum or its membranes.

This is one of the diseases in which catheterism of the Eustachian tube is sometimes necessary, but, I believe, not so often as is generally resorted to. When the patient himself can readily pass a stream of air into the drum, by making a forced expiration, and at the same time holding the mouth and nose, whilst we apply our ear, or a stethoscope, to his external ear, so that we can distinctly perceive the full and natural inflation of the membrane, the introduction of a catheter, and the pressure of a stream of cold air, I believe to be not only unnecessary, but injurious. In cases, however, where mucus has collected in the cavity of the tympanum, catheterism should be resorted to occasionally, and even warm water, or some bland fluid, thrown up by means of a syringe, although I have my doubts as to the quantity of any fluid which can be thus driven into the tympanum, in order to wash out mucus, pus, blood, or other extraneous substances. I am aware that in this opinion I differ from many distinguished authorities, and particularly from my friend, Mr. Pilcher, but it is, nevertheless, the result of considerable experience in the management of such cases. As I do not believe that the enlarged tonsils which

often accompany this disease (as they do other strumous affections) are the *cause* of the deafness and the inflammation manifest in the drum and its membranes, I cannot recommend their removal, as has been proposed, and, I believe, acted on by others; but the application of a strong solution of a nitrate of silver to the back of the throat and fauces, and particularly towards the mouth of the Eustachian tube, by means of a piece of lint attached to the end of an aneurism needle, and applied as far up as possible behind the pillars of the soft palate, will be attended with beneficial results; and the use of astringent gargles should be persevered in during the continuance of the throat affection. If otorrhœa ensues, it is to be treated as I have recommended in my former essay upon that subject.

Gout may occasionally attack the tympanal membrane, but I have never seen a case of it myself; instances have been recorded of its exhibiting itself in the auricle. It is stated that gonorrhœa appears sometimes in the external auditory canal, but we still want careful examination and accurate observation to establish these cases.

V. SYPHILITIC INFLAMMATION.

Although practitioners who treat syphilitic diseases upon a large scale appear to be aware of the fact that venereal occasionally causes deafness, I cannot find any authority which has noticed the disease I am about to describe. The deafness which sometimes accompanies the secondary form of syphilis is generally believed to be caused by inflammation and ulceration extending from the throat through the Eustachian trumpet into the middle ear; such may, under certain circumstances, no doubt, occur, and produce destructive inflammation and suppuration in this cavity, although I have never met with such a case myself, nor have I seen a well authenticated instance of it recorded. The English writers upon aural diseases have completely omitted syphilitic affections of the ear, as have also Kramer, Schmalz, and most of the continental writers, with the exception

of Lincke. Martell Frank, the last writer of note, in his *Practische Anleitung*, enumerates two forms of the disease,—the first, external syphilitic otitis, in which secondary syphilitic ulcerations occur in the auditory canal, accompanied by other well-determined symptoms of the disease. These, however, are already known to the surgeon; they resemble the ulcerations which occur on the margins of the tarsal cartilages, and are sometimes the consequences of rupia seated upon the auricle, in the vicinity of the meatus. Under the head of otitis interna, he describes that form which is the result of lues, which, he says, arises either as a reflex of the disease in the ear itself, or is propagated through the Eustachian tube, as an extension of inflammatory action in the throat. He says this disease is accompanied by great pain, and often terminates in suppuration of the middle ear, destruction of the tympanal membrane and the ossicula, caries of the temporal bone, profuse otorrhœa, and exfoliation, &c. It is evident, however, from his description, that the disease of which he speaks is the ordinary suppuration of the cavity of the tympanum, with neglected otorrhœa and caries, and in no wise characterized by any peculiar syphilitic symptom.

Lincke's usual accuracy and observation seem to have deserted him when writing his chapter upon "Otitis Syphilitica;" for, while the affection now under consideration seems totally to have escaped his observation, he has, with most laborious German assiduity, collected together a multiplicity of authorities bearing upon the subject of what are supposed to be syphilitic diseases of the ear, but not one of which he himself has verified. Thus, he enumerates from the works of Cullerien and Plisson chancres both on the auricle and in the meatus. He also gives a description of chancres, "if they arise near or *on* the membrana tympani!" but, like Frank, his descriptions are chiefly in reference to the syphilitic otorrhœa, the result of inflammation and ulceration extending from the throat or nose, a disease which it yet remains to be proved, by

original observers (not system-makers or cyclopædia-compilers), at all exists.

While Lineke's work, *Handbuch der Theoretischen und Praktischen Ohrenheilkunde*, must ever remain a most valuable book of reference, it is high time for those who wish to advance the science of aural surgery to cast off the incubus of authority, and by patient investigation and originality of observation establish facts. Kramer deserves much more credit for omitting all notice of an affection which it is evident he had never himself observed, than those writers who, with equal want of knowledge, have endeavoured, by collecting out of a variety of obscure writers some ill-recorded cases, to establish an untenable theory.

The disease which I am about to describe is an inflammation of a specific character, occurring in the membranes of the tympanal cavity, but chiefly exhibited in the external membrane of the drum. All the cases I have seen of this affection occurred in young men, and generally those of fair complexions and blue eyes, who had had primary sores upon the genitals from six to twelve months previously, which sores were rather of a deceptive character, so that mercury was seldom given in the first instance, at least in a legitimate form. These sores were usually tedious in healing, and followed by papular eruptions and sore throats, for which mercury was, in most of the cases, taken irregularly. Buboes were not a common attendant, nor had iritis ensued in any of the instances of well-marked venereal myringitis which fell under my notice; but copper-coloured blotches, fissures, and ulcers of the tongue, with loss of strength and slight nocturnal pains, generally speaking, existed previous to the aural affection, which should, I think, be ranked as a tertiary symptom. In four cases out of five of this disease which I witnessed last year, the disease appeared suddenly, as an eruption was fading off; in the fifth it came on at a later period, and was accompanied by loss of hair; in all it appeared in the upper

or middle ranks of life. In some cases there is at first a sensation of fulness in the head, and often vertigo upon stooping or rising up suddenly, and the patients have usually a feeling of fulness within the ear; but in no instance have I seen it accompanied by acute pain, in which circumstances it resembles the subacute form of inflammation already described at page 83, but upon inspection the amount of redness and vascularity will be found very much greater than the latter; and in this consists one of the chief characteristics of this disease, that while it is unaccompanied by local pain, as in the subacute inflammation, the membrana tympani will be found to present an amount of redness equal to, and sometimes exceeding, that seen in acute myringitis. The redness has generally, however, a brownish hue in the syphilitic form, which is not observable in that just alluded to. There is not, at first, much loss of polish, but in a short time the membrane assumes a fuzzy appearance. The auricle and meatus I have not seen affected more than in the subacute form; both ears are usually affected at the same time. The amount of deafness is usually very great, and is the symptom that first attracts the patient's attention, and it seldom varies. Tinnitus is not usually present, but in two cases which I possess the notes of the deafness was ushered in by a very loud noise, which passed away after a few days. This inflammation does not end in mucous or muco-purulent discharge from the surface of the membrane, or the sides of the auditory canal; nor have I seen lymph effused upon the external surface of the membrane, as in the more violent and painful forms of otitis; but from the *brownish*-red colour of the membrane in the early stage, from a yellow-speckled opacity, which is generally observable in it on the subsidence of the redness, and from the intense degree of thickening and opacity which were present in some cases, which were evidently the result of syphilitic myringitis, I am inclined to think that lymph is largely effused between the laminæ, or upon the inner surface of the

membrana tympani. Two of the worst cases of deafness (not congenital) I ever saw, appeared to have been the result of syphilitic inflammation, and in both there was great thickening, opacity, and insensibility of the membrane. I am also inclined to think that syphilis has played a more extensive part in the production of deafness than the profession is at all aware of.

Case VI.—*Syphilitic Inflammation of both Tympanal Membranes; Mercurial Treatment; rapid Recovery.*

Mr. A. B. had a doubtful-looking sore upon the penis, twelve months previous to my seeing him in October last. Considerable doubt was expressed as to the genuine syphilitic character of the sore. It healed under local treatment. Some months subsequently he had a bubo in the right groin, and a small abscess also formed on the under side of the urethra, he then rubbed in mercury, and was confined to the recumbent posture until the swelling in the groin had completely subsided. After this he experienced great weakness and lassitude, and suffered for several weeks from sore throat. These symptoms were relieved by removal to the country; but on his return to town, an eruption appeared extensively on the genitals, thighs, and abdomen, and he had also some slight deafness. These symptoms were relieved by the use of the hydriodate of potash. The eruption, however, came and went, both on its original seat and on the chest and extremities, during the next few weeks. I first saw him, with Mr. Evans, in the middle of October last; he had then no sore throat, but a fresh crop of eruption, in the form of brownish spots, interspersed with small pimples, had appeared generally over the back and the outer sides of the arms. He had also become exceedingly deaf, hearing the watch only when pressed against the auricle, and he complained of a sense of giddiness and fulness in the head, but had no pain whatever in the ears, nor any snuffling in the nose. He stated that his deafness had occurred suddenly, a few hours after rising in the morning, some days before; he had had some noise at

the commencement, but it had now nearly vanished. Upon inspection, the auditory canal was found dry, and the membrana tympani of an uniform dark, brown-red colour, so that the situation of the hammer bone was not easily recognizable. There was no ulceration observable, nor any alteration in the plane of the membrane; but the light was not reflected from it in the ordinary manner, thus shewing that it had lost its polish. These appearances were nearly the same upon both sides. He was able to inflate the drums perfectly, and auscultation afforded no evidence either of contraction of the auditofaucial passages, or of any accumulation of fluid within the drums.

The treatment consisted in the application of leeches round the meatus every second day, and the use of calomel and opium in small and frequently repeated doses. This mode of administering the mineral disagreeing, having produced diarrhœa and great tenesmus, we were obliged to discontinue it, and substitute inunction in its stead. The deafness and the appearance in the ear remained unaltered until the morning on which salivation was produced, and then hearing was restored almost miraculously, and the next day the redness and vascularity in the ears had almost disappeared. Gentle ptyalism was kept up for some days longer. He has not since had any return either of the deafness or other syphilitic symptoms.

I attended a case with Mr. Cusack two years ago, in which it was found necessary to keep up the mercurial action for above a fortnight, but in this instance the disease had been of a much longer standing. I treated a well-marked case last summer in consultation with Mr. Mason, in which several relapses occurred, just as we often observe in syphilitic iritis.

VI. FEBRILE SUBACUTE INFLAMMATION ACCOMPANYING THE EXANTHEMATA AND OTHER FEVERS,—GENERALLY PRODUCING OTORRHŒA.

Although, in forming a classification of inflammations of the tympanal membrane, it became necessary to introduce the fore-

going heading, it is unneeessary for me to here describe those aural affections whieh aecompany the exanthemata, as being always aeeompanied by purulent discharges, I have fully detailed their symptoms and treatment in one of my former Contributions to Aural Surgery,—the essay on Otorrhœa. Moreover, I am not at present able to state from personal knowledge what are the peculiarities of the inflammation which preeedes the diseharge in those cases ; as, although of very commen oceurrenee, the practitioner in aural surgery does not in general see them till long after their first appearanee,—seldom, indeed, till the disease beeomes ehronie, and eomplicated with polypus; or often not till long after uleeration has destroyed the membrane, the ossieula have been diseharged, and other irreparable misehief has oeeurred. During the recent epidemic of influenza I have had some opportunities of examining the membrane in the early stage of this affeetion, and I have found it dark-red, thickened, and very pulpy, like a highly injected portion of the intestinal mueous membrane.

In the foregoing essay I may to some have appeared prolix, but on a subjeet eomparatively so new in English medical literature, so little studied, and, eonsequently, so little understood, by practitioners in general, it was impossible to explain my meaning without entering into minute descriptions. If aural diseases were as attentively studied in these kingdoms as ophthalmie or obstetrie medicine, then would the lengthened deseription of eases be unneeessary; but where do we find, throughout the whole circle of our periodieal literature, half-a-dozen well observed and aeeurately noted eases of diseases of the ear in a twelvemonth ? Faithful observation and elinical reeords of disease are now more required in this than any other branch of medical seienee.

THE END.